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1990
MINNESOTA
MOTOR VEHICLE
CRASH FACTS

DEPARTMENT OF PUBLIC SAFETY

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MOTOR VEHICLE
CRASH FACTS
1990

A summary of crashes occurring on Minnesota roadways based upon accident reports submitted by investigating police officers and drivers to the Minnesota Department of Public Safety

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DEPARTMENT OF PUBLIC SAFETY
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Accidents are the leading cause of death to people through age 37 and the fourth leading cause of death among people of all ages. Traffic crashes are by far the leading cause of accidental death. Hundreds of people die each year and thousands are injured in Minnesota alone. The economic loss due to crashes in the state in 1990 exceeded $700,000,000.

Traffic crashes are not just accidents that happen at random and cannot be avoided. Instead, they are events that have causes. The causes can be controlled so that personal suffering and economic loss are reduced. For example, if all motor vehicle operators drove at speeds that are legal and safe for conditions, and if all operators and passengers used the safety equipment required by law, traffic crashes, fatalities, and injuries would dramatically decrease.

Great improvements have been made during the last two decades. In 1971, there were 1,024 traffic fatalities. Last year there were 568. In 1971, the fatality rate per hundred million vehicle miles traveled was 4.38. Last year it was 1.47, the lowest it has even been.

The Department of Public Safety is committed to carrying out its duty to protect the safety of Minnesota citizens in a way that will extend into the future the improvements that have already been made. The Department registers vehicles and issues driver's licenses to citizens. It withdraws licenses as well, when vehicle operators are shown to pose an unreasonable threat to others on public roadways. It also recommends legislation and carries out programs to promote traffic safety.

The annual *Minnesota Motor Vehicle Crash Facts* publication is produced in accordance with state law. It is in effect a census of traffic crashes that occur in the state. It outlines the principal dimensions of this costly problem as part of the Department's effort to help ameliorate the problem.

Sincerely,

Ralph Church

Ralph Church
Commissioner

TABLE OF CONTENTS

DEFINITIONS v

INTRODUCTION 1

Figure 1 Vehicles, Drivers, and Fatality Rate, 1964 - 1990 4

I: ALL CRASHES 5

WHO was involved

Table 1.01 Crash, Fatality, and Injury Summary, 1981 - 1990 7
Table 1.02 Traffic Crash Trends 1985 - 1990 8
Table 1.03 1990 Fatalities by Traffic Role, Sex, and Age 9
Table 1.04 Age and Sex of Persons Killed or Injured in 1990 Crashes 10
Figure 1.01 Age and Sex of Persons Killed and Injured, 1990 10
Table 1.05 Drivers in 1990 Crashes by Physical Condition 11
Table 1.06 Drivers in 1990 Crashes by Age and First Harmful Event in Crash 11
Table 1.07 Age and Sex of Drivers in 1990 Crashes 12
Table 1.08 Licensed vs. Crash-Involved Drivers by Age, 1990 13
Figure 1.02 Licensed vs. Crash-Involved Drivers by Age, 1990 13
Table 1.09 Single-Vehicle Crashes: Contributing Factors, by Percent, Within Driver Age Groups, 1990 14
Table 1.10 Multiple-Vehicle Crashes: Contributing Factors, by Percent, Within Driver Age Groups, 1990 15
Table 1.11 People Killed or Injured in Various Vehicle Types, 1990 16
Table 1.12 Driver License Summary by Age, 1981 - 1990 17

WHAT the conditions were

Table 1.13 Motor Vehicle Registrations, 1981 - 1990 18
Table 1.14 Types of Motor Vehicles in 1990 Crashes 19
Table 1.15 1990 Crashes and Injuries by First Harmful Event 20
Table 1.16 1990 "Hit-and-Run" Crashes and Injuries by First Harmful Event 20
Table 1.17 1990 Crashes by Traffic Control Device 21
Table 1.18 1990 Crashes by Light Condition 22
Table 1.19 1990 Crashes by Weather Condition 22
Table 1.20 Contributing Factors in 1990 Crashes 23
Table 1.21 1990 Crashes by Road Surface Condition 24

WHERE they happened

Table 1.22 1990 Crashes by Road Design 24
Table 1.23 1990 Crashes by Type of Roadway 25
Table 1.24 1990 Crashes by Population of Area 26
Figure 1.03 Fatal vs. Total Crashes, by Location, 1990 26
Table 1.25 1990 County Crash Report 27
Figure 1.04 1990 County Crash Map 30
Table 1.26 1990 Crashes in Cities of 2,500 or More Population 31

WHEN they happened

Table 1.27 1990 Crashes by Time and Day 36
Figure 1.05 Fatal Crashes vs. Total Crashes, by Time, 1990 37
Table 1.28 1990 Crashes, Fatalities, and Injuries by Month 37
Table 1.29 Holiday Crash Summary, 1986 - 1990 38

II: ALCOHOL-RELATED CRASHES 39

Table 2.01 Drinking Driver Summary, 1981 - 1990 40
Table 2.02 DWI Arrests by Age, 1981 - 1990 41
Table 2.03 Age of Persons Killed and Injured in 1990 Alcohol-Related Crashes 42
Table 2.04 1990 Alcohol-Related Fatalities' Level of Intoxication by Traffic Role 43
Table 2.05 Percent of Deaths, Injuries, and Property Damage Crashes Determined to be Alcohol-Related, 1984 - 1990 43
Figure 2.01 1990 Alcohol-Related Crashes by Time of Day 44
Figure 2.02 1990 Alcohol-Related Crashes by Day of Week 44
Table 2.06 Alcohol-Related Fatal Crashes by First Harmful Event, 1990 45
Table 2.07 Test Results of Drivers Killed, 1981 - 1990 45
Table 2.08 Drivers Killed Who Tested .01 or Higher, 1981 - 1990 ("Drinking") 46
Table 2.09 Drivers Killed Who Tested .10 or Higher, 1981 - 1990 ("Drunk") 46
Figure 2.03 Drivers Killed Who Had Been Drinking 1981 - 1990 47
Figure 2.04 Percent of Drivers Killed Who Had Been Drinking, by Age, 1990 47
Table 2.10 1990 Driver Fatalities' Level of Alcohol Concentration by Age 48
Table 2.11 1990 Driver Fatalities' Level of Alcohol Concentration by Month 49
Table 2.12 1990 Driver Fatalities' Level of Alcohol Concentration by Road Type 49
Table 2.13 1990 Driver Fatalities' Level of Alcohol Concentration by Time of Day 50
Table 2.14 1990 Driver Fatalities' Level of Alcohol Concentration by Day of Week 50

III: SAFETY EQUIPMENT USE BY VEHICLE OCCUPANTS IN 1990 CRASHES 51

Table 3.01 Motor Vehicle Occupants Killed or Injured, by Age and Severity of Injury, 1990 52
Figure 3.01 Safety Equipment Use Among Motor Vehicle Occupants Killed and Injured, by Age, 1990 52
Table 3.02 Safety Equipment Use by Vehicle Occupants Killed or Injured, by Age and Injury Severity, 1990 53
Table 3.03 Percent of Injured or Killed Motor Vehicle Occupants Who Used Safety Equipment by Injury Severity and Year, 1984 - 1990 54
Table 3.04 Safety Equipment Use by Motor Vehicle Occupants Killed and Injured, by Roadway Type, 1990 54
Table 3.05 Safety Equipment Use by Motor Vehicle Occupants Killed and Injured by EMS Region of State, 1990 55
Table 3.06 Percent of Front Seat Occupants Wearing Safety Belts, by Date of Observation Survey 56
Table 3.07 Safety Equipment Use Among Infants and Children in Three Observational Studies 57

IV: MOTORCYCLE CRASHES 58

Table 4.01 Motorcycle Crash Summary, 1981 - 1990 59
Table 4.02 1990 Motorcycle Crashes by First Harmful Event 60
Table 4.03 1990 Motorcycle Crashes by Population of Area 60
Table 4.04 1990 Motorcycle Crashes by Month 61
Figure 4.01 1990 Motorcycle Crashes by Time of Day 61
Table 4.05 1990 Motorcycle Crashes by Time and Day 62
Table 4.06 Motorcyclists Killed or Injured by Age and Sex, 1990 63
Figure 4.02 Motorcyclists Killed and Injured by Age and Sex, 1990 63
Table 4.07 Helmet Use by Motorcyclists Killed or Injured, 1986 - 1990 64

Table 4.08 Endorsement Status of Motorcycle Operators Involved in Fatal Crashes, 1981 - 1990 64
Table 4.09 Alcohol Use by Motorcycle Drivers, 1981 - 1990 65
Table 4.10 1990 Motorcycle Driver Fatalities' Level of Alcohol Concentration by Age 65
Table 4.11 Contributing Factors in 1990 Motorcycle Crashes 56

V: TRUCK CRASHES 67

Table 5.01 Truck Crash Summary, 1985 - 1990 68
Table 5.02 Persons Injured or Killed in 1990 Truck Crashes by Vehicle Occupied 68
Table 5.03 Contributing Factors in 1990 Truck Crashes 69
Table 5.04 Age of Truck Drivers in 1990 Crashes 70
Table 5.05 Drivers in 1990 Truck Crashes by Physical Condition 70
Table 5.06 1990 Truck Crashes by First Harmful Event 71
Table 5.07 1990 Truck Crashes by Road Surface Condition 71
Table 5.08 1990 Truck Crashes by Time and Day 72
Figure 5.01 1990 Truck Crashes by Time of Day 72
Table 5.09 1990 Truck Crashes by Month 73
Table 5.10 1990 Truck Crashes by Weather Condition 73
Table 5.11 1990 Truck Crashes by Population of Area 74
Table 5.12 1990 Truck Crashes by Type of Roadway 74

VI: PEDESTRIAN CRASHES 75

Table 6.01 Pedestrian Crash Summary, 1981 - 1990 76
Figure 6.01 Pedestrian Fatalities by Age 1981 - 1990 Combined 76
Table 6.02 Pedestrians Killed or Injured by Age and Sex, 1990 77
Figure 6.02 Pedestrians Killed and Injured by Age and Sex, 1990 77
Table 6.03 1990 Pedestrian Crashes by Month 78
Figure 6.03 1990 Pedestrian Crashes by Time of Day 78
Table 6.04 1990 Pedestrian Crashes by Time and Day 79
Table 6.05 1990 Pedestrian Crashes by Population of Area 80
Table 6.06 Vehicle Movement in 1990 Pedestrian Crashes 80
Table 6.07 Prior Action of Pedestrians Killed or Injured in 1990 81
Table 6.08 Contributing Factors in 1990 Pedestrian Crashes 82
Table 6.09 Pedestrian Fatalities' Level of Alcohol-Concentration, 1981 - 1990 83
Figure 6.04 Percent of Fatally Injured Pedestrians Who Had Been Drinking, 1981 - 1990 83
Table 6.10 1990 Pedestrian Fatalities' Level of Alcohol Concentration by Age 84
Table 6.11 1990 Pedestrian Fatalities' Level of Alcohol Concentration by Time of Day 84

VII: BICYCLE CRASHES 85

Table 7.01 Bicycle Crash Summary, 1981 - 1990 86
Table 7.02 1990 Bicycle Crashes by Month 86
Table 7.03 1990 Bicycle Crashes by Time and Day 87
Figure 7.01 1990 Bicycle Crashes by Time of Day 87
Table 7.04 Bicyclists Killed or Injured by Age and Sex, 1990 88
Figure 7.02 Bicyclists Killed and Injured by Age and Sex, 1990 88
Table 7.05 Contributing Factors in 1990 Bicycle Crashes 89
Table 7.06 Prior Action of Bicyclists Involved in 1990 Crashes 90

Table 7.07 1990 Bicycle Crashes by Population of Area 90

VIII: SCHOOL BUS CRASHES 91

Table 8.01 School Bus Crash Summary, 1981 - 1990 92
Table 8.02 Age and Sex of Persons Killed and Injured in 1990 School Bus Crashes 92
Table 8.03 Persons Killed or Injured in 1990 School Bus Crashes by Population of Area 93
Table 8.04 1990 School Bus Crashes by First Harmful Event 93
Table 8.05 1990 School Bus Crashes by Time of Day 94
Table 8.06 1990 School Bus Crashes by Month 94
Table 8.07 Contributing Factors in 1990 School Bus Crashes 95
Table 8.08 1990 School Bus Crashes by Traffic Control Device 96

IX: MOTOR VEHICLE/TRAIN CRASHES 97

Table 9.01 Motor Vehicle/Train Crash Summary, 1981 - 1990 98
Table 9.02 Age of Persons Killed or Injured in 1990 Motor Vehicle/Train Crashes 98
Table 9.03 1990 Motor Vehicle/Train Crashes by Month 99
Table 9.04 1990 Motor Vehicle/Train Crashes by Time and Day 99
Table 9.05 Contributing Factors in 1990 Motor Vehicle/Train Crashes 100
Table 9.06 1990 Motor Vehicle/Train Crashes by Traffic Control Device Present 100

DEFINITIONS

Motor Vehicle Accident/Crash - An accident that involves a motor vehicle in transport on a public traffic-way in Minnesota and results in injury, death, or at least $500.00 in property damage.

Fatal Accident/Crash - A motor vehicle crash on a public traffic-way in which at least one person dies unintentionally as a result of the crash. The death must occur within 30 days of the accident.

Severe or Incapacitating Injury - An injury (other than a fatal injury) that prevents the injured person from walking, driving or normally continuing the activities he or she was capable of performing before the injury occurred. Includes severe lacerations, broken or distorted limbs, skull fracture, crushed chest, internal injuries, unconsciousness, etc. Hospitalization is usually required.

Moderate or Non-Incapacitating injury - An injury (other than a fatal or severe injury) that is evident to the officer at the scene of the accident. Includes abrasions, minor lacerations, bleeding, etc. May require medical treatment, but hospitalization is usually not required.

Minor or Possible Injury - An injury (other than a fatal, severe, or moderate injury) that is reported by a person involved in the accident. Includes complaint of physical pain when no cause is evident, momentary unconsciousness, limping, nausea, hysteria, etc.

INTRODUCTION

At the end of the 1990 calendar year, 3,178,491 people held Minnesota driver licenses and 3,522,768 motor vehicles were registered in the state. Vehicles traveled an estimated 38.8 billion miles on public roadways in the state. There were 99,236 traffic crashes; 568 people died and 44,634 people were injured in those crashes. This report provides a statistical summary of those crashes.

Legislative requirement

Minnesota Motor Vehicle Crash Facts is produced annually by the Office of Traffic Safety, Minnesota Department of Public Safety, in accordance with state law. Minnesota Statutes, Section 169.09, requires that traffic accidents be reported to the Department. Section 169.10 then requires the Department to ". . . tabulate . . . all accident reports . . . and publish annually . . . statistical information based thereon as to the number and circumstances of traffic accidents."

Section 169.09 specifies the conditions under which a crash must be reported and who shall make the report. "The driver of a vehicle involved in an accident resulting in bodily injury to or death of any person or total property damage to an apparent extent of $500 or more" must submit a report within ten days of the crash. The law enforcement officer who investigates the crash must also submit a report within ten days.

The minimum dollar amount for crashes involving only property damage has changed over the years. The first minimum was set at $50 in 1939. It was raised to $100 in 1965, to $300 in 1976, and then to the current minimum of $500 in 1981.

The purpose of *Crash Facts* is to provide summary statistical information about the crashes reported to the state each year. The term "crash" is used in preference to "accident." The latter term suggests there is a random, unavoidable quality about the events in question, as though they were acts of God. In fact, though, the experience of the last two decades potently demonstrates that advances in engineering and technology, coupled with changes in public policy and individual human behavior, can dramatically reduce the number and severity of traffic crashes.

The report is divided into nine sections. The first presents information on the aggregate of all crashes reported to the state during the preceding calendar year. The remaining eight focus on specific areas in which interest among policy makers and the public seems to be broadest. Section II deals with alcohol-related crashes. Section III is about the use of safety equipment by occupants of vehicles required to be equipped with passenger protection systems, including child safety seats and safety belts. The following five sections focus on crashes that involved motorcycles (section IV), trucks (section V), pedestrians (section VI), bicycles (section VII), and school buses (section VIII). The final section (IX) summarizes information on collisions between motor vehicles and trains.

Cost of Traffic Crashes

The necessity of getting from one place to another and the efficiency of motor vehicles for this purpose result in significant costs to society. The National Safety Council reports that accidents (from all causes) are the leading cause of death among persons aged 1 to 37 and

the fourth leading cause of death among all persons (*Accident Facts, 1990 Edition*, p. 6).

Motor vehicle crashes are by far the leading cause of accidental death, especially among the young. For example, among 15- to 24-year-olds in the country in 1987, there were 14,447 deaths from traffic crashes, compared to 1,097 from drowning (the next most frequent cause of accidental death). In the same age group, homicide and suicide each accounted for about 5,000 deaths, and disease and other natural causes accounted for about 9,000 (*Accident Facts, 1990 edition*, p. 7).]

It is possible to estimate economic costs of traffic crashes, although the results can vary depending on definitions and estimating procedures. For example, in 1980 the National Safety Council estimated that, on average, a motor vehicle death cost $170,000 in wage loss, medical expense, insurance administration costs, and property damage. In the same year the National Highway Traffic Safety Administration used the figure of $268,727 for the average cost of a motor vehicle death. Both organizations also estimated costs of injuries. The former used a three-category scale for injury severity and the latter used a five-category scale.

Neither the National Safety Council nor the National Highway Traffic Safety Administration attempt to include in their estimates a value for pain and suffering caused by death or injury. Nor do their estimated costs represent a dollar amount that people would be willing to pay to avoid death or injury.

Many states use the National Safety Council's economic cost figures, the most recent of which are based on 1989 data. Based on those, the total economic loss from 1990 traffic crashes in Minnesota was $717,862,100, a figure which is calculated as follows:

568	deaths	@$290,000	=$164,720,000
5,015	severe injuries	@$32,000	=$160,480,000
15,001	moderate injuries	@ $8,300	=$124.508,300
24,618	minor injuries	@ $2,600	= $64,006,800
68,049	property damage crashes	@ $3,000	=$204,147,000
		Total	=$717,862,100

Factors Influencing Crash Incidence and Severity

Some form of conceptual model of traffic crashes will assist in thinking about the problem and in thinking about approaches to it. A multiplicity of factors may contribute to even a single crash. A domestic quarrel may lead to driver distraction, which together with wet, slippery pavement and high traffic congestion at an intersection causes a traffic crash. But public policy cannot address the infinite number of individual causes imaginable.

There is a more limited number of factors that significantly affect the aggregate of traffic crashes. These can be organized into logical groups, such as human behavior factors or vehicle safety factors.

Factors also have a logical time order, some being antecedent to others. For example, changing dram shop laws to increase server liability could reduce alcohol impairment among bar patrons, leading to reduced drunk driving incidence and fewer alcohol related accidents. Increased funding of emergency medical services could increase the number of crash victims who are transported to hospital emergency rooms within the first "golden hour" after a crash, thereby reducing the number of traffic deaths, and the number of crashes classified as fatal. The following paragraphs outline some of the factors most frequently thought to affect crash incidence and severity.

Vehicle Safety Factors: Engineering and design standards for vehicle performance can help prevent crashes from occurring. When there is a crash, vehicles designed for safety can increase survivability. For example, the design of windshield glass and the location and durability of gas tanks can increase safety. The "passenger packaging" inside a vehicle can reduce injury severity through means such as padded dashboards and collapsible steering wheel columns. Passenger protection systems in vehicles (airbags, safety belts, etc.), if used, can eliminate injuries or reduce their severity.

Behavior factors: For all crashes, the driver behaviors police cite most often as contributing factors are, in order of frequency, driver inattention or distraction, failure to yield right of way, and illegal or unsafe speed. In fatal crashes, illegal or unsafe speed is cited most often, followed by physical impairment (usually by alcohol). Reducing these behaviors would reduce crashes. When there is a crash, using safety equipment will reduce severity. Motorcyclists and bicyclists should wear helmets. Vehicle occupants should use safety belts. Infants should always be placed in child safety seats.

Roadway characteristics: Limited access highways carry about a fifth of the traffic volume in Minnesota, yet account for only about a twelfth of fatal accidents. They are built to high roadway engineering standards and are very safe, relatively speaking. In general, roadway characteristics conducive to safety include wide lanes, clearly visible striping, flared guardrails, wide shoulders of good quality, shoulders and roadsides free of obstacles, well-located crash attenuation devices, well-planned use of traffic signals, and effective communication to roadway users through clear and visible signing.

Environmental factors: Weather conditions affect crash incidence and severity. Clear dry roads are conducive to high speeds; consequently, fatal crashes have a pronounced seasonal variation, peaking in the warm summer months and falling in the winter months. The total number of crashes is driven by the incidence of the less serious property damage crashes, which tend to have a reverse seasonal variation, peaking in the winter months.

Volume of traffic, or vehicle miles traveled (VMT), is a predictor of crash incidence. All other things being equal, as VMT increases, so will traffic crashes. The relationship may not be simple, however; after a point, increasing congestion leads to reduced speeds, changing the proportion of crashes that occur at different severity levels.

Quality and availability of emergency medical services might be classified as an environmental factor. The first hour after a traumatic episode, such as a traffic crash, has been called the "golden hour." Victims who receive emergency services within that time have markedly improved chances of survival.

The age structure of the population has a strong effect on crash incidence, although it is not generally thought about since demographic changes are so gradual. In Minnesota, about one in eight teenaged drivers are involved in crashes each year. The involvement rate drops off for successive age groups. For example, it is about 1 in 25 for drivers in their forties. The aging of the baby boom has reduced crash incidence.

Historical Perspective

In 1966, there were 53,041 traffic fatalities in the country, or 5.7 for every hundred million miles of travel. In Minnesota in 1968, there were 1,060 traffic fatalities, or 5.3 per hundred million miles of travel. Those were the worst years. Since then, both the rate and the number of fatalities has declined in a fairly steady pattern. Last year, there were 44,500 traffic fatalities throughout the country and 568 in Minnesota. The respective rates per hundred million miles of travel were 2.1 and 1.47. A dramatic benefit has been achieved.

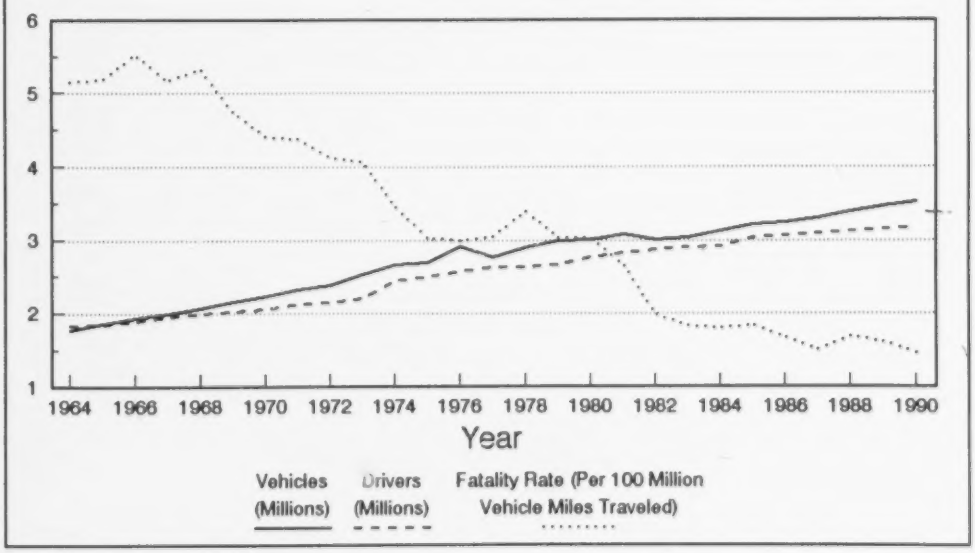
The benefit is in large part the result of conscious decision-making on traffic safety issues. The National Highway Traffic Safety Administration (originally called the National Safety Bureau) was established in the U.S. Department of Transportation in 1967. Since then it has promoted, and Congress has passed, legislation mandating the manufacture of safer cars. At the same time, the federal interstate highway system has expanded, contributing to a safer roadway environment.

Simultaneously there has been an effort to change human behavior factors. Minnesota has been a leader among the states in the development of innovative drunk driving countermeasures. The Legislature made significant amendments to the DWI law in 1971, 1976, 1978, and in almost every year of the 1980s. It also passed the child passenger protection law in 1981, and the mandatory seat belt law in 1986. It subsequently amended those laws, closing loopholes, broadening their scope, and strengthening penalties.

The benefits of action in these areas are clear. The graph below is one illustration. It shows a steady increase in the number of drivers and vehicles, but a steady decrease in the fatality rate per hundred million miles of travel.

FIGURE 1

Vehicles, Drivers, and Fatality Rate, 1964-1990



ALL CRASHES

There were almost 100,000 crashes in 1990. Over two-thirds (69%) were property damage only crashes. There were 30,684 injury crashes and 503 fatal crashes in which 44,634 people were injured and 568 people died. The fatality rate per 100 million vehicle miles traveled was 1.47, the lowest it has ever been in the state, and one of the lowest rates in the country. There were 13.0 fatalities per 100,000 population. The following sections describe the crashes in terms of the people involved, what the conditions were, and where and when they occurred.

WHO was involved

Most crash victims were car or pickup truck occupants

Seventy-two percent of the people who died and 83% of those injured were drivers or passengers in passenger cars or pickup trucks. Two other large categories, among those killed, were pedestrians (65 deaths, or 11% of the total) and motorcyclists (50 deaths, or 9% of the total). Among those injured, van occupants and motorcyclists each accounted for an additional 4%, and bicyclists and pedestrians each accounted for an additional 3%.

Victims were disproportionately young

Forty-one percent of the fatalities and 43% of those injured were between the ages of 15 and 29. Men outnumbered women almost two to one among those killed, but the ratio was equal among those injured.

Drivers were disproportionately male and young

Forty-three percent of the drivers in fatal crashes and 41% of the drivers in injury crashes were between the ages of 15 and 29. Male drivers outnumbered female drivers 2.6 to 1 in fatal crashes. Male drivers in injury crashes outnumbered female drivers in injury crashes 1.6 to 1 (even though females were injured in crashes as often as males).

Police suspected alcohol more in fatal crashes

For each driver in a crash, police indicate on the accident report if they suspect the person to have been drinking, or to have been under the influence of alcohol, according to the legal definition of that term. The police so indicated for 3% of the drivers in property damage accidents, 8% of the drivers in injury crashes, and 20% of the drivers in fatal crashes. (Such reports are believed to understate alcohol involvement, however.)

Most crashes involve another motor vehicle

For drivers of all ages, the most common type of crash was collision with another motor vehicle in traffic. This was true of 75% or more of drivers in different age groups. Young drivers, though, were in more single-vehicle crashes than older drivers; 16% of the under-25 drivers hit fixed objects or were in a crash where their vehicle overturned.

Contributing factors differ from single-vehicle to multiple-vehicle crashes

Police can cite zero, one, or two contributing factors for each driver in a crash. In single vehicle crashes, the three factors cited most often, in order of frequency, were "illegal or unsafe speed," "driver inattention or distraction," and "physical impairment." In multiple vehicle crashes, four factors were cited more than others. In order of frequency, they were: "driver inattention or distraction," "failure to yield right of way," "illegal or unsafe speed," and "following too closely."

Contributing factors differ by driver age

"Driver inexperience" was cited relatively often for teenaged drivers. "Illegal or unsafe speed" was cited more often as driver age decreased. In single-vehicle crashes, "driver inattention or distraction" was cited more often as driver age increased. In multiple-vehicle crashes, "failure to yield right of way" was cited relatively frequently for drivers over 65.

WHAT the condition were

40% of crashes occurred despite traffic signal

Most crashes occurred where there was no traffic signal of any kind, but about 40% occurred where there was some form of sign or traffic signal. For fatal crashes, 17% occurred

where there was a stop sign, but not for all approaches. For crashes at all severity levels, 18% occurred where there was a traffic light; another 15% occurred where there was a stop sign, but not at all approaches.

Fatal crashes occurred in poor light
Sixty-one percent of all crashes occurred in daylight conditions, compared to fewer than half of the fatal crashes. Thirty-four percent of fatal crashes occurred after dark where there were no street lights; another 13% occurred after dark, but where there were street lights; 6% occurred during dawn or dusk.

Most crashes occurred in good weather and on dry roads
Eighty-five percent of fatal crashes and 81% of all crashes occurred during clear or cloudy weather conditions. Seventy-five percent of fatal crashes and 67% of all crashes occurred on dry road surfaces.

Speed and alcohol cited most in fatal crashes
In fatal crashes, the contributing factors cited most often were "illegal or unsafe speed" (representing 19% of all factors cited), followed by "physical impairment" (16%), and then "driver inattention or distraction" (15%). For both injury and property damage crashes, "driver inattention or distraction" came first (26% of the total factors cited), followed by "failure to yield right of way" (15%), then "illegal or unsafe speed" (12%).

WHERE they happened

Fatal crashes occurred in rural areas, non-fatal in urban areas
Sixty-eight percent of fatal crashes occurred on two-lane, two-way roads. To a large extent, these were trunk and county state aid highways in rural areas. By contrast, 68% of all crashes occurred in urban areas (defined as cities having a population of 5,000 or more people). Of these crashes, 39% occurred on local streets and 51% occurred on trunk and county state aid highways passing through these towns and cities.

Seven-county metro area has one third of fatal crashes
The seven-county metro area has about half the state's population, but it was the site of 36% of the fatal crashes and 60% of all crashes that occurred in the state. The two cities of Minneapolis and St. Paul together (representing 15% of the state's population) accounted for 9% of fatal crashes and 24% of total crashes.

WHEN they occurred

Fatal crashes were highest after midnight, total crashes were highest in late afternoon
Both fatal and non-fatal crashes reached their lowest frequency around 4:00 to 5:00 AM. Fatal crashes increased erratically after that and reached their highest number between 1:00 and 2:00 AM, when 31 people died. Total crashes, by contrast, climbed somewhat more steadily to a pronounced high between 5:00 and 6:00 PM, during which time period almost 8,000 crashes occurred over the course of the year.

Fridays and Saturdays were over-represented
Forty-one percent of the fatal crashes occurred on either Fridays or Saturdays. Total crashes were more evenly divided among days of the week, although the highest percentage (18%) occurred on Fridays, and the second highest percentage (16%) occurred on Saturdays.

July was highest for fatal crashes, December for all crashes
Fatal crashes were distributed erratically across the months of the year. March was unusually low, with only 3% of the total. July, August, September and November were high months, together accounting for 231, or 46% of the total. Total crashes were almost evenly divided across months, except that December was considerably higher than average, with almost 12,000 crashes, or 12% of the total.

TABLE 1.01

CRASH, FATALITY, AND INJURY SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Traffic Crashes	97,879	89,443	97,371	93,741	99,168	95,460	94,095	102,094	105,996	99,236
Persons Killed	763	581	558	584	610	572	530	615	605	568
Persons Injured	43,739	38,692	41,086	41,808	44,316	42,130	42,091	44,415	45,404	44,634
Registered Motor Vehicles (Millions of Vehicles)	3.09	3.01	3.03	3.13	3.22	3.25	3.31	3.39	3.46	3.52
Licensed Drivers* (Millions of Drivers)	2.83	2.87	2.90	2.91	3.04	3.07	3.10	3.13	3.16	3.18
Vehicular Miles Traveled (Billions of Miles)	28.6	29.2	30.5	32.2	33.1	34.2	35.1	36.4	37.6	38.8
Fatality Rate Per Hundred Million Vehicle Miles Traveled	2.67	1.98	1.83	1.81	1.84	1.67	1.51	1.69	1.61	1.47
Fatality Rate Per 100,000 Registered Motor Vehicles	24.7	19.3	18.4	18.7	18.9	17.6	16.0	18.1	17.5	16.1
Fatality Rate Per 100,000 Population	18.6	14.2	13.5	14.1	14.7	13.6	12.6	14.3	13.9	13.0
Crash Rate Per Hundred Million Vehicle Miles Traveled	342	304	319	291	300	279	268	280	282	256
Crash Rate Per 100,000 Registered Vehicles	3,163	2,972	3,214	2,995	3,080	2,937	2,840	3,012	3,060	2,817
Crash Rate Per 100,000 Population	2,387	2,181	2,356	2,262	2,380	2,266	2,233	2,371	2,435	2,268

* Permits included.

TABLE 1.02

TRAFFIC CRASH TRENDS
1985 - 1990

	1985	1986	1987	1988	1989	1985-1989 Average	1990	% Change from 5 Yr Average	Record High	
Total Crashes	**99,168**	**95,460**	**94,095**	**102,094**	**105,996**	**99,362.6**	**99,236**	**-0.1**	**123,106**	**(1975)**
Fatal Crashes	**538**	**506**	**466**	**545**	**539**	**518.8**	**503**	**-3.0**	**878**	**(1973)**
Injury Crashes	**30,638**	**29,226**	**29,345**	**30,743**	**31,576**	**30,305.6**	**30,684**	**+1.2**	**33,686**	**(1978)**
Severe	5,038	4,437	4,566	4,386	4,111	4,507.6	4,016	-10.9	5,109	(1984) [1]
Moderate	12,326	11,610	11,517	11,066	11,057	11,515.2	10,641	-7.6	12,326	(1985) [1]
Minor	13,274	13,179	13,262	15,291	16,408	14,282.8	16,027	+12.2	16,408	(1989) [1]
Property Damage Crashes	**67,992**	**65,728**	**64,284**	**70,806**	**73,881**	**65,538.2**	**68,049**	**+3.8**	**94,810**	**(1975)**
Total Injuries	**44,316**	**42,130**	**42,621**	**44,415**	**45,404**	**43,777.2**	**44,634**	**+2.0**	**50,332**	**(1978)**
Total Fatalities	**610**	**572**	**530**	**615**	**605**	**586.4**	**568**	**-3.1**	**1,060**	**(1968)**
Pedestrian	65	71	62	69	67	66.8	65	-2.7	157	(1971)
Motor Vehicle/Train[2]	13	12	4	12	15	11.2	17	+51.8	62	(1932)
Bicycle	10	12	15	16	10	12.6	8	-36.5	24	(1977)
Motorcycle	77	66	51	58	37	57.8	50	-13.5	121	(1980)
3-Wheel Vehicle	1	9	2	1	5	3.6	2	-44.4	9	(1986)
Snowmobile	3	5	0	4	3	3.0	1	-66.7	9	(1984)
Motor Vehicle Occupants	441	402	396	459	478	435.2	431	-1.0	478	(1989) [1]
Fatality Rate[3]	1.84	1.67	1.51	1.69	1.61	1.66	1.47	-11.6	23.6	(1934)
U.S. Fatality Rate[3]	2.6	2.6	2.6	2.3	2.2	2.5	2.1	-14.6	18.0	(1925)
Minnesota Economic Loss (millions)	$480.9	$445.7	$506.4	$579.9	$619.0	$526.4	$717.9	+36.4	$717.9	(1990) [4]

[1] The available records on which these "record highs" are based only go back to 1984.
[2] Fatalities occurring in motor vehicle/train crashes are included in other categories as well.
[3] Rate is based upon per 100 million vehicle miles of travel.
[4] The record economic loss is a function of inflation rather than trends in traffic safety.

TABLE 1.03

1990 FATALITIES BY TRAFFIC ROLE, SEX, AND AGE

Type of Vehicle	Position in Vehicle	Sex	Age 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70 & Older	Total
Car or Truck	Driver	Male	0	28	51	41	20	15	12	25	192
		Female	0	13	25	15	9	9	4	15	90
	Passenger	Male	5	17	25	14	2	0	2	8	73
		Female	9	11	8	9	6	9	4	11	67
	Unknown	Male	0	1	3	1	0	0	0	0	6
		Female	0	0	1	1	1	0	0	0	3
Motorcyle	Operator	Male	0	8	20	9	4	0	0	0	41
		Female	0	0	1	0	0	0	0	1	2
	Passenger	Male	0	2	1	0	0	0	0	0	3
		Female	0	2	1	1	0	0	0	0	4
Motorscooter or Moped	Driver	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	1	0	0	0	0	0	1
All Terrain Vehicle	Driver	Male	0	0	1	0	0	0	0	0	1
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	1	0	0	0	0	0	0	1
		Female	0	0	0	0	0	0	0	0	0
Snowmobile	Driver	Male	0	0	1	0	0	0	0	0	1
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	0	0	0	0	0	0	0
Other Motor Vehicle**	Driver	Male	0	0	2	0	2	2	1	0	7
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	1	0	0	0	1	0	0	0	2
		Female	0	0	0	0	0	0	0	0	0
	Unknown	Male	0	0	1	0	0	0	0	0	1
		Female	0	0	0	0	0	0	0	0	0
Bicyclist		Male	2	2	1	0	0	0	1	1	7
		Female	0	0	0	0	1	0	0	0	1
Pedestrian		Male	5	4	9	9	1	2	5	5	40
		Female	0	4	1	4	1	2	4	9	25
Total Fatalities		Male	13	63	115	74	30	19	21	39	375*
		Female	9	30	38	30	18	20	12	36	193
		Total	22	93	153	104	48	39	33	75	568

* Included in the total column (but not in other columns) is one male car or truck occupant whose position in the vehicle and whose age was unknown.

** "Other motor vehicle" includes school bus (3 fatalities), bus other than school bus (1 fatality), farm tractor or equipment (4 fatalities), and "other privately owned vehicle" (2 fatalities).

TABLE 1.04

AGE AND SEX OF PERSONS KILLED OR INJURED IN 1990 CRASHES

	Persons Killed			Persons Injured		
Age Group	Male	Female	Total	Male	Female	Total*
0 - 4	4	4	8	584	569	1,155
5 - 9	9	5	14	866	744	1,616
10 - 14	5	7	12	938	881	1,824
15 - 19	58	23	81	3,933	3,918	7,852
20 - 24	75	24	99	3,295	3,066	6,363
25 - 29	40	14	54	2,565	2,513	5,081
30 - 34	45	14	59	2,024	2,000	4,027
35 - 39	29	16	45	1,571	1,645	3,216
40 - 44	18	12	30	1,197	1,288	2,487
45 - 49	12	6	18	766	906	1,673
50 - 54	10	16	26	641	704	1,345
55 - 59	9	4	13	509	558	1,067
60 - 64	10	5	15	446	542	988
65 - 69	11	7	18	405	547	952
70 - 74	11	11	22	306	484	790
75 - 79	9	13	22	269	361	631
80 - 84	13	7	20	179	215	395
85 & Older	6	5	11	96	90	186
Not Stated	1	0	1	1,248	1,331	2,986
Total	375	193	568	21,838	22,362	44,634

* Many totals do not add across because sex is not always indicated on the accident report.

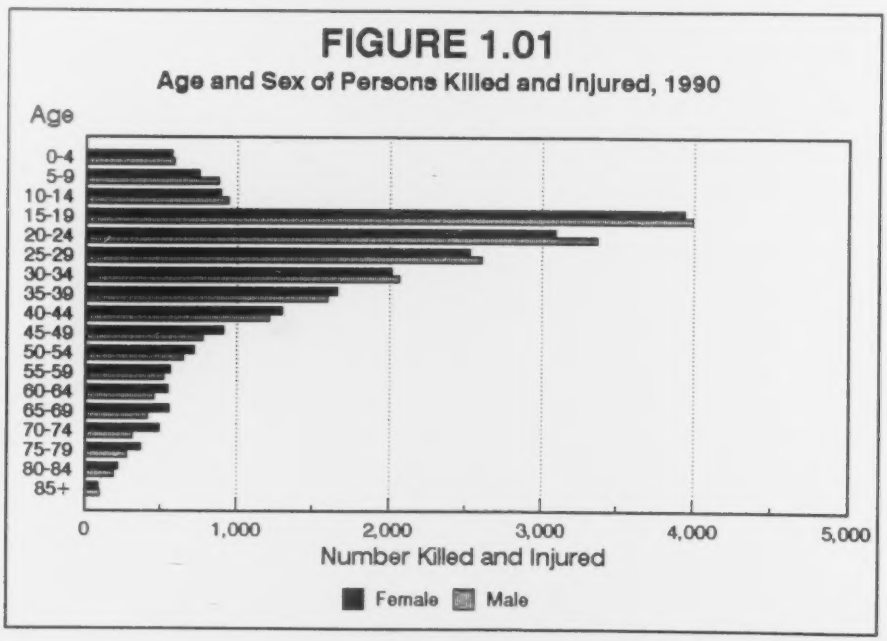


TABLE 1.05

DRIVERS IN 1990 CRASHES BY PHYSICAL CONDITION*

Physical Condition	Drivers in Fatal Crashes	Drivers in Injury Crashes	Drivers in Property Damage Crashes	Drivers in All Crashes
Normal	443	40,279	75,229	115,951
Under the Influence	78	2,460	2,169	4,707
Had Been Drinking	77	1,982	1,730	3,789
Had Been Using Drugs	3	43	34	80
Asleep	9	347	332	688
Fatigued	8	162	149	319
Ill	3	156	83	242
Other	17	315	484	816
Unknown	152	8,925	42,924	52,001
Total	790	54,669	123,134	178,593

* As noted by police officer on accident report. Pedestrians and bicyclists are not included.

TABLE 1.06

DRIVERS IN 1990 CRASHES BY AGE AND FIRST HARMFUL EVENT IN CRASH

First Harmful Event	Drivers 15-19	Drivers 20-24	Drivers 25-29	Drivers 30-34	Drivers 35-64	Drivers 65-79	Drivers 80 & Older
Collision With:							
Other Motor Vehicle	74.5%	77.1%	78.9%	79.7%	81.5%	85.5%	86.5%
Parked Motor Vehicle	3.6	2.7	2.6	2.5	2.2	2.9	5.1
Railroad Train	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bicycle	0.5	0.6	0.8	0.7	0.9	0.9	0.9
Pedestrian	0.8	0.8	0.9	0.8	0.9	0.9	1.2
Animal	2.6	3.6	4.4	4.8	5.7	3.5	1.0
Fixed Object	10.9	9.5	7.7	7.0	5.5	4.1	3.4
Other Object	0.7	0.7	0.6	0.6	0.6	0.4	0.4
Non-Collision:							
Overturn	5.5	4.0	3.2	2.8	2.0	1.1	0.7
Other Non-Collision	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Other	0.7	0.7	0.8	0.8	0.6	0.4	0.4
Total Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Drivers	24,055	25,486	22,898	19,125	52,500	9,466	2,003

Percentages are based on the number of crash-involved drivers in each age group. They may not sum to 100 due to rounding. Bicyclists and pedestrians are not included.

TABLE 1.07

AGE AND SEX OF DRIVERS IN 1990 CRASHES*

	Drivers in Fatal Crashes				Drivers in All Crashes			
Age Group	Male	Female	Not Stated	Total	Male	Female	Not Stated	Total
14 & Younger	1	0	0	1	130	56	1	187
15 - 19	81	36	0	117	14,636	9,410	9	24,055
20 - 24	100	32	0	132	15,456	10,012	18	25,486
25 - 29	63	27	0	90	14,049	8,829	20	22,898
30 - 34	68	20	0	88	11,701	7,412	12	19,125
35 - 39	54	15	0	69	9,189	6,205	19	15,413
40 - 44	36	19	0	55	7,578	4,931	4	12,513
45 - 49	28	7	0	35	5,234	3,265	8	8,507
50 - 54	27	12	0	39	4,013	2,350	1	6,364
55 - 59	21	6	0	27	3,318	1,806	2	5,126
60 - 64	16	10	0	26	3,008	1,567	2	4,577
65 - 69	15	5	0	20	2,484	1,449	1	3,934
70 - 74	10	9	0	19	1,937	1,211	1	3,149
75 - 79	11	10	0	21	1,460	919	4	2,383
80 - 84	12	4	0	16	831	483	1	1,315
85 & Older	5	1	0	6	512	176	0	688
Not Stated	0	0	29	29	3,934	2,169	16,770	22,873
Total*	548	213	29	790	99,470	62,250	16,873	178,593

* Most crashes involve more than one driver, causing the total number of drivers to exceed the total number of crashes. (Pedestrians and bicyclists are not shown in this table.)

TABLE 1.08

LICENSED VS. CRASH-INVOLVED DRIVERS BY AGE, 1990

Age Group	Percentage of All Licensed Drivers	Percentage of Drivers in Fatal Crashes	Injury Crashes	Property Damage Crashes	All Crashes
14 & Younger	0.0%	0.1%	0.2%	0.1%	0.1%
15 - 19	6.7	14.8	15.4	12.6	13.5
20 - 24	10.0	16.7	15.4	13.7	14.3
25 - 29	11.7	11.4	13.9	12.4	12.8
30 - 34	12.5	11.1	11.4	10.4	10.7
35 - 39	11.5	8.7	9.2	8.4	8.6
40 - 44	10.0	7.0	7.3	6.9	7.0
45 - 49	7.4	4.4	4.8	4.7	4.8
50 - 54	6.0	4.9	3.8	3.5	3.6
55 - 59	5.2	3.4	2.9	2.9	2.9
60 - 64	5.0	3.3	2.7	2.5	2.6
65 - 69	4.7	2.5	2.3	2.1	2.2
70 - 74	3.9	2.4	1.8	1.7	1.8
75 - 79	2.9	2.7	1.5	1.3	1.3
80 - 84	1.7	2.0	0.8	0.7	0.7
85 & Older	0.9	0.8	0.4	0.4	0.4
Not Stated	0.0	3.7	6.2	15.8	12.8
Total Percent*	100.0%	100.0%	100.0%	100.0%	100.0%
Total Number**	3,178,491	790	54,669	123,134	178,593

* Percents may not sum to 100 due to rounding.
** Includes drivers with instruction permits.

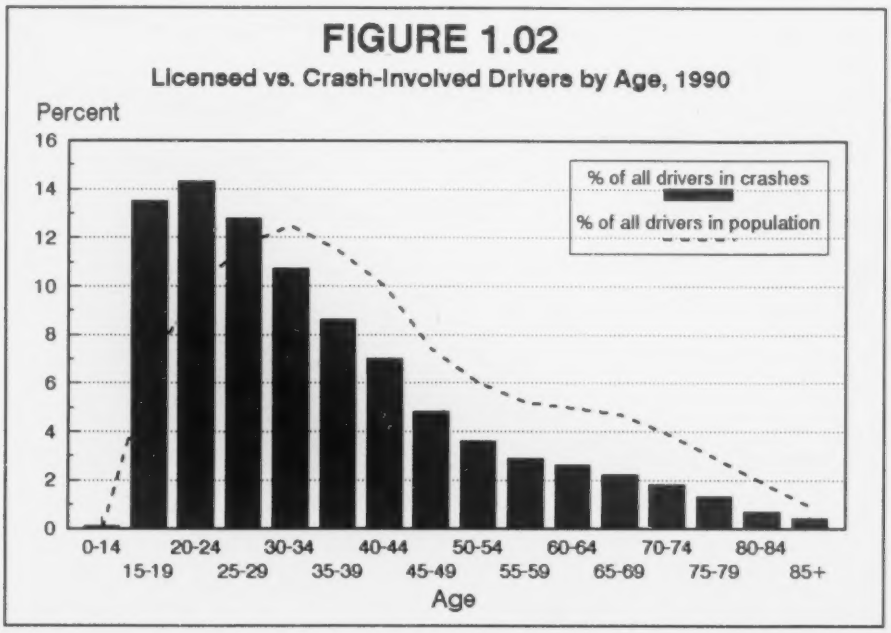


TABLE 1.09

SINGLE-VEHICLE CRASHES: CONTRIBUTING FACTORS, BY PERCENT, WITHIN DRIVER AGE GROUPS, 1990

Contributing Factors	Drivers 15-19	Drivers 20-24	Drivers 25-29	Drivers 30-34	Drivers 35-64	Drivers 65-79	Drivers 80 & Older
Human Factors:							
Illegal/Unsafe Speed	25.8%	25.4%	21.7%	21.1%	17.1%	8.5%	3.9%
Driver Inattention/Distraction	18.5	20.5	22.0	21.5	24.3	29.2	31.8
Physical Impairment	9.7	17.3	18.9	18.5	14.2	14.6	11.8
Driver Inexperience	20.1	5.3	3.1	2.4	2.9	1.7	0.8
Improper/Unsafe Lane Use	3.7	4.8	5.3	5.5	4.8	4.3	5.9
Failure to Yield Right of Way	1.4	1.8	2.7	2.7	3.6	7.1	7.5
Driving Left of Center–Not Passing	1.8	2.3	1.6	1.7	1.5	1.5	0.8
Vision Obscured	1.4	1.6	2.0	1.9	2.8	3.3	11.0
Unsafe Backing	1.5	1.3	1.3	1.9	2.2	4.8	7.1
Disregard for Traffic Control Device	0.9	1.3	1.0	1.1	1.2	1.4	1.6
Improper Turn	0.9	1.5	1.4	1.6	2.0	1.9	1.6
Improper Passing/Overtaking	0.7	0.7	0.6	1.2	0.5	0.5	2.4
Improper Parking/Starting/Stopping	0.3	0.6	0.6	0.5	1.0	1.9	4.3
Following Too Closely	0.2	0.5	0.6	0.5	0.7	0.7	1.2
Improper or No Signal	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Impeding Traffic	0.1	0.2	0.2	0.2	0.2	0.2	0.4
Other Human Factors	2.2	2.2	2.9	2.4	2.5	3.8	3.5
Vehicular Factors:							
Skidding	3.3	3.8	3.3	3.6	4.4	3.3	0.8
Defective Equipment	1.5	1.8	1.8	1.5	2.0	1.1	0.4
Other Vehicular Factor	1.2	1.4	2.4	2.4	2.8	2.7	2.0
Miscellaneous Factors:							
Weather	4.2	5.4	5.9	7.0	8.5	6.8	1.6
Road Defects	0.4	0.3	0.4	0.6	0.7	0.6	0.0
Total Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Contributing Factors Cited	7,196	5,780	4,172	3,026	6,289	981	255
No Improper Driving	1,097	1,451	1,397	1,255	3,712	423	57
Total Number of Drivers	6,143	5,842	4,822	3,874	9,724	1,373	270

Percentages are based on all contributing factors cited within each age group. Zero, one, or two contributing factors may be attributed to a single driver. The percentages may not sum to 100 due to rounding. Bicyclists and pedestrians are excluded.

For contributing factors in multiple-vehicle crashes, see Table 1.10. For contributing factors in crashes at different levels of severity, see Table 1.20.

TABLE 1.10

MULTIPLE-VEHICLE CRASHES: CONTRIBUTING FACTORS, BY PERCENT, WITHIN DRIVER AGE GROUPS, 1990

Contributing Factors	Drivers 15-19	Drivers 20-24	Drivers 25-29	Drivers 30-34	Drivers 35-64	Drivers 65-79	Drivers 80 & Older
Human Factors:							
Driver Inattention/Distraction	25.9%	27.5%	28.0%	28.2%	28.6%	27.7%	26.2%
Failure to Yield Right of Way	19.3	17.2	16.4	16.9	20.3	31.3	37.3
Illegal/Unsafe Speed	10.2	10.9	10.1	9.1	7.1	4.2	2.4
Following Too Closely	9.0	10.4	10.9	9.9	8.2	4.7	3.0
Disregard for Traffic Control Device	4.3	5.3	4.9	4.7	5.1	6.7	7.4
Improper/Unsafe Lane Use	3.5	4.1	4.1	4.7	5.1	5.2	5.0
Vision Obscured	3.3	3.1	3.4	3.4	3.8	3.5	2.4
Improper Turn	2.5	2.4	2.6	2.6	3.3	4.4	3.9
Physical Impairment	1.1	2.5	3.2	3.5	2.5	1.4	2.8
Improper Passing/Overtaking	2.0	2.1	2.1	2.3	1.9	1.2	1.4
Driving Left of Center--Not Passing	1.6	1.4	1.3	1.3	1.2	0.8	1.1
Improper Parking/Starting/Stopping	1.0	1.1	1.0	1.1	1.3	1.2	1.6
Driver Inexperience	8.3	2.0	1.1	1.0	0.7	0.3	0.2
Unsafe Backing	0.8	1.3	1.1	1.3	1.6	1.4	1.4
Improper or No Signal	0.5	0.3	0.5	0.6	0.6	0.7	0.4
Impeding Traffic	0.3	0.4	0.5	0.5	0.5	0.3	0.6
Other Human Factors	0.6	0.9	1.2	1.1	1.1	0.9	0.9
Vehicular Factors:							
Skidding	1.7	2.1	1.9	2.2	1.8	0.9	0.2
Defective Equipment	1.2	1.0	1.0	0.9	0.7	0.2	0.2
Other Vehicular Factor	0.4	0.4	0.6	0.6	0.5	0.5	0.2
Miscellaneous Factors:							
Weather	2.5	3.4	3.7	3.9	3.9	2.5	1.4
Road Defects	0.1	0.2	0.2	0.2	0.3	0.1	0.1
Total Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Contributing Factors Cited	15,832	13,863	11,193	8,830	22,860	5,934	1,761
No Improper Driving	5,080	6,727	6,926	6,205	18,250	2,573	303
Total Number of Drivers	17,912	19,644	18,076	15,251	42,776	8,093	1,733

Percentages are based on all contributing factors cited within each age group. Zero, one, or two contributing factors may be attributed to a single driver. The percentages may not sum to 100 due to rounding. Bicyclists and pedestrians are excluded.

For contributing factors in single-vehicle crashes, see Table 1.09. For contributing factors in crashes at different levels of severity, see Table 1.20.

TABLE 1.11

PEOPLE KILLED OR INJURED IN VARIOUS VEHICLE TYPES, 1990

Vehicle Type	Killed	Injured			
		Severe	Moderate	Minor	Total
Passenger Car	335	3,203	10,624	18,726	32,553
Passenger Car & Trailer	1	7	11	23	41
Truck or Truck Tractor	3	40	147	232	419
Truck Tractor and Semi-Trailer	4	19	74	101	194
Truck Tractor with Twin Trailer	0	0	2	2	4
Truck With Other Trailer	0	3	13	24	40
Pickup Truck	73	497	1,544	2,402	4,443
Van	15	154	474	940	1,568
Motorcycle*	50	446	707	452	1,605
Motorscooter/Motorbike*	1	10	30	11	51
Motorized Bicycle (moped)*	0	14	22	4	40
All Terrain Vehicle	2	9	7	9	25
School Bus	3	8	65	115	188
Bus	1	12	24	97	133
Motorhome/Camper	0	2	9	13	24
Snowmobile	1	10	7	10	27
Farm Equipment	4	6	11	20	37
Taxicab	0	5	14	42	61
Hit and Run Vehicle	0	18	75	107	200
Police Vehicle	0	6	27	70	103
Fire Department Vehicle	0	0	2	0	2
Ambulance	0	0	2	5	7
Military Vehicle	0	0	0	0	0
Road Maintenance Vehicle	0	0	6	7	13
Other or Unknown Motor Vehicle	2	2	3	25	30
Bicycle	8	193	613	521	1,327
Pedestrian	65	351	488	660	1,449
Total	568	5,015	15,001	24,618	44,634

* On the accident report form, police may show that a vehicle is a "motorcycle," a "motorscooter/motorbike," or a "moped or motorized bicycle." Since 1986, however, the law recognizes just two categories. If the vehicle has an engine capacity of more than 50 cc, it is classified as a motorcycle; if it has 50 cc or smaller engine capacity, it is classified as a motorized bicycle. The term moped is short for motorized pedalcycle, which is the same as motorized bicycle.

TABLE 1.12

DRIVER LICENSE* SUMMARY BY AGE, 1981 - 1990

Age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
15	12,788	13,083	13,867	14,686	13,116	11,920	12,301	13,387	14,072	12,832
16	50,982	48,011	46,133	47,296	47,959	48,944	45,397	42,178	41,544	42,885
17	64,370	59,238	55,725	54,135	56,670	57,829	59,321	53,900	49,458	48,496
18	64,762	64,119	63,250	60,026	58,553	59,910	61,276	62,772	56,250	52,070
19	76,675	72,700	69,786	60,681	62,361	60,626	61,767	62,637	63,653	58,230
20	79,607	78,110	74,788	71,195	65,449	62,040	60,229	61,076	62,770	63,375
15 - 19	269,577	257,151	248,761	236,824	238,659	239,229	240,062	234,874	224,977	214,513
20 - 24	395,496	392,548	388,573	376,051	370,613	352,170	336,289	326,738	319,048	316,504
25 - 29	369,236	376,034	381,076	384,544	405,120	402,984	399,409	396,744	386,440	372,178
30 - 34	329,488	336,185	343,874	350,728	370,634	374,138	380,972	385,508	393,168	398,645
35 - 39	257,450	270,169	281,484	295,902	322,827	329,018	335,262	344,613	355,869	364,385
40 - 44	204,317	215,529	224,477	231,740	241,313	257,213	269,275	280,236	298,889	316,265
45 - 49	175,196	177,343	182,122	185,534	195,594	202,083	213,358	221,666	229,993	234,494
50 - 54	173,361	171,348	168,949	168,248	170,984	171,833	174,453	179,129	184,310	189,266
55 - 59	169,120	169,761	169,520	167,629	169,847	168,037	165,791	164,032	163,520	164,023
60 - 64	152,104	154,268	154,937	157,311	161,519	161,268	161,733	161,449	160,260	159,799
65 - 69	128,310	130,611	133,450	133,503	139,155	141,584	143,841	144,830	147,857	148,161
70 - 74	95,385	99,435	101,548	103,525	112,352	115,619	118,338	120,753	121,638	122,965
75 - 79	62,717	66,109	67,908	69,288	77,369	80,947	85,032	86,901	89,355	92,378
80 - 84	31,251	34,356	35,191	35,359	42,850	46,817	50,812	51,922	52,667	55,000
85 & Older	12,889	15,199	15,272	14,619	20,482	23,305	27,326	27,634	27,179	29,915
Total	2,825,897	2,866,046	2,897,142	2,910,805	3,039,318	3,066,245	3,101,953	3,127,029	3,155,170	3,178,491

* Includes Learner's Permits

TABLE 1.13

MOTOR VEHICLE REGISTRATIONS, 1981 - 1990

Type of Vehicle*	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Passenger Cars	2,092,170	2,157,922	2,185,457	2,258,877	2,339,782	2,395,247	2,450,232	2,518,604	2,583,982	2,642,022
Pickups	410,349	464,801	469,116	490,087	500,744	501,646	509,070	515,968	526,212	528,342
Trucks	317,738	129,248	120,690	119,667	118,990	124,323	127,888	135,918	137,690	140,874
Recreational Vehicles	35,187	31,926	31,791	32,451	33,133	32,026	33,120	34,226	34,805	35,328
Motorcycles	166,151	159,345	155,502	153,851	151,449	141,261	134,590	128,956	123,308	120,081
Motorized Bicycles	13,955	14,725	14,516	13,633	13,034	12,047	12,311	10,529	9,987	9,306
School Buses	4,031	4,002	4,113	3,998	4,185	4,598	5,095	5,115	5,026	5,037
Buses	3,256	3,459	3,490	3,604	3,575	3,405	3,502	3,879	4,217	3,780
Van Pool	0	0	0	137	180	209	229	253	248	259
Tax Exempt Vehicles	47,694	48,732	49,811	51,525	53,510	35,741	37,659	35,969	38,106	37,739
Motor Vehicle Subtotal	3,094,939	3,014,160	3,034,486	3,127,830	3,218,582	3,250,503	3,313,696	3,389,417	3,463,581	3,522,768
Trailers	565,914	614,631	565,046	615,004	602,795	663,559	653,630	726,054	708,693	780,484
Collector's Vehicles	26,579	30,569	35,048	39,981	45,269	50,702	56,146	61,280	66,860	72,031
Total Registrations	3,687,432	3,659,360	3,634,580	3,782,815	3,866,646	3,964,764	4,023,472	4,176,751	4,239,134	4,375,283

* Minnesota license plates on a vehicle signify that it has been registered with the state and that the owner has paid the registration fee. The vehicle classification used for registration purposes is similar, but not identical, to the vehicle classification (shown in Tables 1.11 and 1.14) police use in reporting accidents. Following are some notes on the registration categories shown above:

Passenger cars include vans, except for "van pools." A van pool is a van used exclusively for car pooling purposes.

Pickup trucks are rated three-fourths ton or less.

Motorcycles have engines exceeding 50 cc; otherwise the vehicle is classified as a motorized bicycle.

Tax exempt vehicles are vehicles owned by city, county, or state offices. They have license plates but no registration fees are paid on them. (Police and fire department vehicles are tax exempt but are not included since they do not have state license plates and are not registered.)

Trailers (such as utility trailers pulled by cars, or semi or twin trailers pulled by trucks) are pulled by motorized vehicles and do not themselves have motors.

Collectors vehicles must be at least 20 years old and cannot be used for normal transportation purposes. They can only be driven, for example, to car shows.

TABLE 1.14

TYPES OF MOTOR VEHICLES IN 1990 CRASHES

Motor Vehicle Type*	Vehicles in Fatal Crashes	Injury Crashes	Property Damage Crashes	All Crashes
Passenger Car	473	40,592	88,738	129,803
Passenger Car with Trailer	2	55	134	191
Truck or Truck Tractor	26	1,002	3,125	4,153
Truck Tractor and Semi-Trailer	44	621	1,812	2,477
Truck Tractor and Twin Trailer	1	11	37	49
Truck With Other Trailer	0	101	228	329
Pickup	138	6,473	14,898	21,509
Van	27	2,141	5,084	7,252
Motorcycle*	47	1,487	251	1,785
Motorscooter/Motorbike*	1	45	2	48
Motorized Bicycle/Moped*	0	43	3	46
All Terrain Vehicle	2	25	8	35
School Bus	5	150	525	680
Bus	4	162	416	582
Motorhome/Camper	2	37	114	153
Snowmobile	1	25	13	39
Farm Tractor or Equipment	5	69	97	171
Taxicab	1	92	238	331
Hit-and-Run Vehicle	6	1,251	6,672	7,929
Police Vehicle	3	156	316	475
Fire Department Vehicle	0	8	31	39
Ambulance	0	12	33	45
Military Vehicle	0	0	10	10
Road Maintenance Vehicle	0	33	149	182
Other Publicly Owned Vehicle	0	41	132	173
Other Privately Owned Vehicle	2	35	68	105
Other	0	2	0	2
Total**	790	54,669	123,134	178,593

* On the accident report form, police may show that a vehicle is a "motorcycle," a "motorscooter/motorbike," or a "moped or motorized bicycle." Since 1986, however, the law recognizes just two categories. If the vehicle has an engine capacity of more than 50 cc, it is classified as a motorcycle; if it has 50 cc or smaller engine capacity, it is classified as a motorized bicycle. The term moped is short for motorized pedalcycle, which is the same as motorized bicycle.

** Most crashes involve more than one vehicle, causing total vehicles to exceed total crashes. Bicyclists and pedestrians are excluded from this table.

TABLE 1.15

1990 CRASHES AND INJURIES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured	Fatality Rate Per 1,000 Crashes
Collision With:							
Another Motor Vehicle	233	19,346	44,195	63,774	277	30,258	4.3
Parked Motor Vehicle	5	654	5,894	6,553	5	807	0.8
Railroad Train	13	35	68	116	17	67	146.6
Bicycle	8	1,288	42	1,338	8	1,333	6.0
Pedestrian	62	1,418	7	1,487	63	1,506	42.4
Animal	3	437	6,409	6,849	3	534	0.4
Fixed Object	91	4,009	8,130	12,230	104	5,292	8.5
Other Object	2	247	594	843	3	315	3.6
Non-Collision:							
Overturn	74	2,761	2,006	4,841	76	3,920	15.7
Fire/Explosion	2	18	137	157	2	20	12.7
Submersion	0	13	26	39	0	15	0
Other	10	458	541	1,009	10	567	9.9
Total	503	30,684	68,049	99,236	568	44,634	5.7

TABLE 1.16

1990 "HIT-AND-RUN" CRASHES AND INJURIES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Collision With:						
Other Motor Vehicle	0	687	2,750	3,437	0	929
Parked Motor Vehicle	0	40	2,723	2,763	0	47
Railroad Train	0	0	4	4	0	0
Bicycle	0	171	11	182	0	179
Pedestrian	6	214	1	221	6	221
Animal	0	1	5	6	0	2
Fixed Object	0	79	994	1,073	0	99
Other Object	0	8	51	59	0	9
Non-Collision:						
Overturn	0	24	41	65	0	30
Fire/Explosion	0	0	4	4	0	0
Submersion	0	0	0	0	0	0
Other	0	12	47	59	0	14
Total	6	1,236	6,631	7,873	6	1,530

TABLE 1.17

1990 CRASHES BY TRAFFIC CONTROL DEVICE

Traffic Control Device	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
None	309	15,927	39,583	55,819	349	22,483
Traffic Signal	31	6,502	11,478	18,011	35	9,448
Overhead Flashers	2	96	188	286	2	160
Stop Sign-All Approaches	6	627	1,389	2,022	8	868
Other Stop Sign	86	5,285	9,593	14,964	96	8,246
Yield Sign	11	596	1,139	1,746	13	952
Flagman, Officer, or School Patrol	0	52	81	133	0	86
School Bus Stop Arm	0	21	38	59	0	31
School Zone Sign	0	16	24	40	0	20
RR Crossing Gate	1	25	50	76	2	40
RR Flashing Lights	1	21	42	64	1	27
RR Crossing Stop Sign	1	6	16	23	1	6
RR Other	8	35	56	99	10	58
No Passing Zone	29	427	509	965	32	715
Other	9	253	395	657	10	394
Unknown	9	795	3,468	4,272	9	1,100
Total	503	30,684	68,049	99,236	568	44,634

TABLE 1.18

1990 CRASHES BY LIGHT CONDITION

Light Condition	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Daylight	231	19,586	40,595	60,412	252	28,508
Dawn/Dusk	32	1,990	5,042	7,064	37	2,765
Dark/Street Lights On	65	5,194	11,942	17,201	71	7,495
Dark/No Street Lights	172	3,658	8,420	12,250	205	5,535
Other/Unknown	3	256	2,050	2,309	3	331
Total	503	30,684	68,049	99,236	568	44,634

TABLE 1.19

1990 CRASHES BY WEATHER CONDITION

Weather Condition	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Clear	291	18,018	37,907	56,216	330	26,083
Cloudy	137	7,683	16,301	24,121	157	11,308
Rain	32	2,648	5,384	8,064	34	3,904
Snow	19	1,139	3,988	5,146	22	1,610
Sleet/Hail	6	479	1,460	1,945	6	682
Fog/Smog/Smoke	8	274	551	833	9	445
Blowing Sand/Dust	5	123	305	433	5	196
Severe Crosswinds	1	36	91	128	1	49
Other	1	36	122	159	1	47
Not Stated/Unknown	3	248	1,940	2,191	3	310
Total	503	30,684	68,049	99,236	568	44,634

TABLE 1.20

CONTRIBUTING FACTORS IN 1990 CRASHES

Contributing Factors	Crash Severity: Fatal Crashes	Crash Severity: Personal Injury Crashes	Crash Severity: Property Damage Crashes	Number of People Affected by the Factor: Killed	Number of People Affected by the Factor: Injured
Human Factors:					
Driver Inattention/Distraction	15.0%	25.7%	25.5%	145	17,126
Failure to Yield Right of Way	11.2	15.2	14.7	106	10,492
Illegal/Unsafe Speed	18.6	12.6	11.9	188	8,534
Following Too Closely	0.5	6.3	6.8	5	4,261
Physical Impairment	15.7	7.8	3.7	152	5,027
Improper/Unsafe Lane Use	4.6	3.4	6.1	42	2,217
Disregard For Traffic Control Device	5.7	5.2	3.4	61	3,817
Driver Inexperience	3.7	4.2	3.6	36	2,921
Vision Obscured	2.2	3.0	2.8	21	1,941
Improper Turn	0.8	1.8	3.1	7	1,253
Improper Passing/Overtaking	2.2	1.2	2.1	27	797
Unsafe Backing	0.1	0.4	2.3	1	255
Driving Left of Roadway Center--Not Passing	6.5	1.8	1.3	72	1,340
Improper Parking/ Starting/Stopping	0.3	0.9	1.3	3	585
Pedestrian Violation/Error	4.2	1.4	0.1	36	685
Improper or No Signal	0.0	0.3	0.5	0	166
Impeding Traffic	0.0	0.3	0.4	0	245
Other Human Factor	1.5	1.6	1.4	14	975
Vehicular Factors:					
Skidding	2.3	1.8	2.4	3	399
Defective Equipment	0.8	1.1	1.1	28	1,507
Other Vehicular Factor	0.6	0.7	1.0	5	476
Miscellaneous Factors:					
Weather	3.3	3.1	4.3	32	2,016
Road Defect	0.3	0.2	0.3	3	140
Total Percent	100.0%	100.0%	100.0%		
Total contributing factors cited	867	44,539	71,732		
No Improper Driving	262	20,647	38,392		
Total Number of Drivers	866	57,498	123,177		

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers and the sum of the people affected by the factors to exceed the number of people killed or injured during the year. Percentages are based on all contributing factors cited; they may not sum to 100 due to rounding. Factors attributed to bicyclists and pedestrians are included in this table.

For contributing factors by age of drivers, see tables 1.09 and 1.10.

TABLE 1.21

1990 CRASHES BY ROAD SURFACE CONDITION

Road Surface Condition	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Dry	379	21,864	44,706	66,949	435	31,697
Wet	64	4,669	9,420	14,153	67	7,038
Snow/Slush	15	1,044	3,170	4,229	17	1,500
Ice or Packed Snow	36	2,542	8,539	11,117	38	3,655
Other	7	279	425	711	9	390
Not Stated/Unknown	2	286	1,789	2,077	2	354
Total	503	30,684	68,049	99,236	568	44,634

TABLE 1.22

1990 CRASHES BY ROAD DESIGN

Road Design	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Freeway	51	2,258	6,859	9,168	55	3,069
Other Divided Highway	54	3,705	6,038	9,797	65	5,798
One-Way Street	6	820	1,284	2,110	6	1,152
4-6 Lanes Undivided	39	6,274	10,196	16,509	40	9,102
3 Lanes	3	215	430	648	3	323
2 Lanes--Two-Way	340	14,110	26,716	41,166	387	21,016
Alley/Driveway	2	224	763	989	2	247
Other	6	273	449	728	8	429
Not Stated/Unknown	2	2,805	15,314	18,121	2	3,498
Total	503	30,684	68,049	99,236	568	44,634

TABLE 1.23

1990 CRASHES BY TYPE OF ROADWAY

Type of Roadway	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Urban						
Interstate	27	1,487	4,713	6,227	30	1,974
Trunk Highway	54	5,885	12,123	18,062	59	8,616
County State Aid Highway	40	5,561	10,659	16,260	43	7,921
County Road	3	269	551	823	3	385
Local Street	46	7,326	19,157	26,529	46	9,854
Other	0	1	0	1	0	2
Total	170	20,529	47,203	67,902	181	28,752
Rural						
Interstate	20	414	1,417	1,851	22	629
Trunk Highway	160	4,212	8,800	13,172	192	6,873
County State Aid Highway	108	3,287	5,326	8,721	121	5,109
County Road	14	577	859	1,450	17	878
Township Road	25	799	1,213	2,037	27	1,244
Local Street	6	704	2,432	3,142	8	953
Other Road	0	162	799	961	0	196
Total	333	10,155	20,846	31,334	387	15,882
All Roadways						
Interstate	47	1,901	6,130	8,078	52	2,603
Trunk Highway	214	10,097	20,923	31,234	251	15,489
County State Aid Highway	148	8,848	15,985	24,981	164	13,030
County Road	17	846	1,410	2,273	20	1,263
Township Road	25	799	1,213	2,037	27	1,244
Local Street	52	8,030	21,589	29,671	54	10,807
Other Road	0	163	799	962	0	198
Total	503	30,684	68,049	99,236	568	44,634

"Urban" refers to an area having a population of 5,000 or more; "rural" refers to an area of less than 5,000.)

TABLE 1.24

1990 CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
100,000 & Over	45	6,964	16,580	23,589	46	9,485
50,000 - 99,999	12	1,688	4,006	5,706	12	2,317
25,000 - 49,999	37	5,494	11,778	17,309	39	7,812
10,000 - 24,999	49	4,181	9,828	14,058	56	5,935
5,000 - 9,999	27	2,202	5,011	7,240	28	3,203
2,500 - 4,999	13	1,046	2,471	3,530	14	1,581
1,000 - 2,499	13	641	1,370	2,024	16	963
Under 1,000	307	8,468	17,005	25,780	357	13,338
Total	503	30,684	68,049	99,236	568	44,634

FIGURE 1.03

Fatal vs. Total Crashes, by Location, 1990

"Urban" refers to an area having a population of 5,000 or more. "Rural" refers to an area of less than 5,000 population.

TABLE 1.25

1990 COUNTY CRASH REPORT

County	1990 CRASHES Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Average Crashes 1985-1989	Number Killed 1990	Average Killed 1985-1989	Number Injured 1990	Average Injured 1985-1989
Aitkin	3	86	171	260	*237*	3	*4*	121	*125*
Anoka	27	1,693	3,218	4,938	*4,789*	30	*22*	2,576	*2,522*
Becker	5	179	281	465	*439*	5	*9*	267	*261*
Beltrami	3	216	465	684	*606*	3	*4*	330	*310*
Benton	9	222	481	712	*654*	12	*7*	334	*328*
Big Stone	2	23	66	91	*106*	2	*2*	34	*58*
Blue Earth	9	376	1,104	1,489	*1,422*	12	*6*	514	*529*
Brown	3	145	317	465	*477*	4	*3*	235	*210*
Carlton	7	163	365	535	*490*	8	*5*	249	*234*
Carver	7	358	691	1,056	*921*	8	*10*	591	*425*
Cass	8	163	234	405	*344*	8	*8*	260	*192*
Chippewa	3	83	108	194	*195*	3	*5*	145	*117*
Chisago	8	202	464	674	*632*	10	*9*	325	*300*
Clay	7	279	698	984	*1,140*	8	*5*	428	*457*
Clearwater	1	47	65	113	*108*	2	*1*	74	*64*
Cook	2	54	137	193	*139*	2	*2*	89	*55*
Cottonwood	1	77	94	172	*179*	1	*3*	110	*90*
Crow Wing	10	333	642	985	*1,057*	13	*10*	535	*496*
Dakota	22	1,391	3,262	4,675	*5,054*	24	*22*	2,009	*2,263*
Dodge	1	69	179	249	*240*	1	*5*	106	*111*
Douglas	8	240	547	795	*730*	9	*7*	377	*336*
Faribault	2	80	133	215	*216*	2	*3*	113	*104*
Fillmore	3	119	258	380	*329*	3	*7*	188	*160*
Freeborn	2	173	464	639	*688*	2	*6*	236	*275*
Goodhue	10	301	638	949	*944*	11	*8*	490	*451*
Grant	1	24	65	90	*89*	1	*2*	38	*42*
Hennepin	65	9,236	19,988	29,289	*30,624*	67	*73*	12,638	*12,850*
Houston	3	86	192	281	*297*	3	*3*	131	*137*
Hubbard	4	113	156	273	*259*	4	*4*	180	*169*
Isanti	2	173	388	563	*462*	2	*4*	277	*244*

TABLE 1.25 CONTINUED

1990 COUNTY CRASH REPORT

County	1990 CRASHES Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Average Crashes 1985-1989	Number Killed 1990	Average Killed 1985-1989	Number Injured 1990	Average Injured 1985-1989
Itasca	13	292	414	719	*623*	19	*8*	450	*347*
Jackson	2	58	144	204	*194*	2	*2*	108	*86*
Kanabec	3	87	149	239	*211*	3	*2*	151	*133*
Kandiyohi	10	270	517	797	*769*	10	*6*	427	*404*
Kittson	1	25	62	88	*82*	1	*3*	42	*50*
Koochiching	3	136	241	380	*232*	3	*3*	215	*120*
Lac Qui Parle	4	32	60	96	*91*	6	*2*	57	*41*
Lake	2	59	172	233	*213*	2	*3*	97	*89*
Lake of The Woods	0	22	70	92	*52*	0	*1*	36	*25*
Le Sueur	1	144	384	529	*485*	1	*5*	194	*200*
Lincoln	2	16	73	91	*93*	2	*1*	28	*51*
Lyon	2	120	242	364	*326*	2	*4*	172	*192*
Mcleod	2	196	481	679	*678*	3	*8*	327	*304*
Mahnomen	2	30	29	61	*62*	2	*2*	61	*58*
Marshall	3	59	97	159	*131*	3	*3*	90	*84*
Martin	1	145	251	397	*354*	1	*2*	220	*182*
Meeker	0	130	333	463	*349*	0	*6*	183	*175*
Mille Lacs	6	143	234	383	*324*	8	*6*	241	*194*
Morrison	10	163	305	478	*503*	11	*6*	264	*266*
Mower	3	189	524	716	*690*	3	*5*	283	*283*
Murray	1	32	73	106	*104*	1	*3*	46	*62*
Nicollet	2	119	398	519	*501*	2	*6*	177	*214*
Nobles	2	92	244	338	*356*	2	*3*	143	*158*
Norman	0	25	56	81	*92*	0	*2*	36	*70*
Olmsted	11	746	1,730	2,487	*2,372*	11	*12*	1,071	*999*
Otter Tail	10	271	550	831	*792*	11	*11*	414	*419*
Pennington	0	114	174	288	*247*	0	*2*	149	*138*
Pine	5	165	315	485	*382*	5	*7*	271	*192*
Pipestone	2	55	126	183	*167*	3	*4*	82	*72*
Polk	6	171	340	517	*567*	8	*7*	281	*296*

TABLE 1.25 CONTINUED

1990 COUNTY CRASH REPORT

	1990 CRASHES								
County	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Average Crashes 1985-1989	Number Killed 1990	Average Killed 1985-1989	Number Injured 1990	Average Injured 1985-1989
Pope	2	39	103	144	*135*	2	*1*	59	*63*
Ramsey	29	3,998	10,467	14,494	*15,232*	31	*33*	5,511	*5,354*
Red Lake	0	17	43	60	*67*	0	*2*	31	*29*
Redwood	2	70	133	205	*200*	2	*3*	115	*104*
Renville	5	98	148	251	*219*	6	*8*	156	*122*
Rice	7	326	735	1,068	*1,034*	9	*6*	484	*490*
Rock	2	49	149	200	*197*	2	*1*	68	*77*
Roseau	3	68	159	230	*208*	3	*4*	99	*99*
St. Louis	19	1,144	2,457	3,620	*3,470*	19	*27*	1,657	*1,565*
Scott	11	392	830	1,233	*1,315*	12	*11*	579	*582*
Sherburne	7	283	526	816	*671*	8	*10*	484	*407*
Sibley	3	55	167	225	*232*	4	*3*	90	*114*
Stearns	10	913	1,946	2,869	*2,759*	12	*15*	1,311	*1,314*
Steele	7	180	576	763	*636*	8	*5*	265	*253*
Stevens	0	40	107	147	*152*	0	*2*	68	*62*
Swift	1	39	74	114	*127*	1	*2*	47	*64*
Todd	5	143	244	392	*368*	5	*7*	246	*230*
Traverse	0	12	33	45	*46*	0	*0*	15	*23*
Wabasha	5	106	232	343	*389*	8	*8*	167	*187*
Wadena	0	103	164	267	*246*	0	*2*	156	*119*
Waseca	3	92	266	361	*327*	5	*3*	126	*137*
Washington	18	762	1,912	2,692	*2,605*	26	*14*	1,175	*1,135*
Watonwan	0	61	115	176	*171*	0	*1*	87	*78*
Wilkin	1	48	98	147	*157*	1	*1*	71	*84*
Winona	4	348	831	1,183	*1,132*	4	*6*	512	*426*
Wright	11	443	801	1,255	*1,215*	11	*21*	674	*661*
Yellow Medicine	1	45	74	120	*140*	1	*2*	65	*71*
Total	503	30,684	68,049	99,236	*99,363*	568	*586*	44,634	*43,672*

FIGURE 1.04

1990 County Crash Map

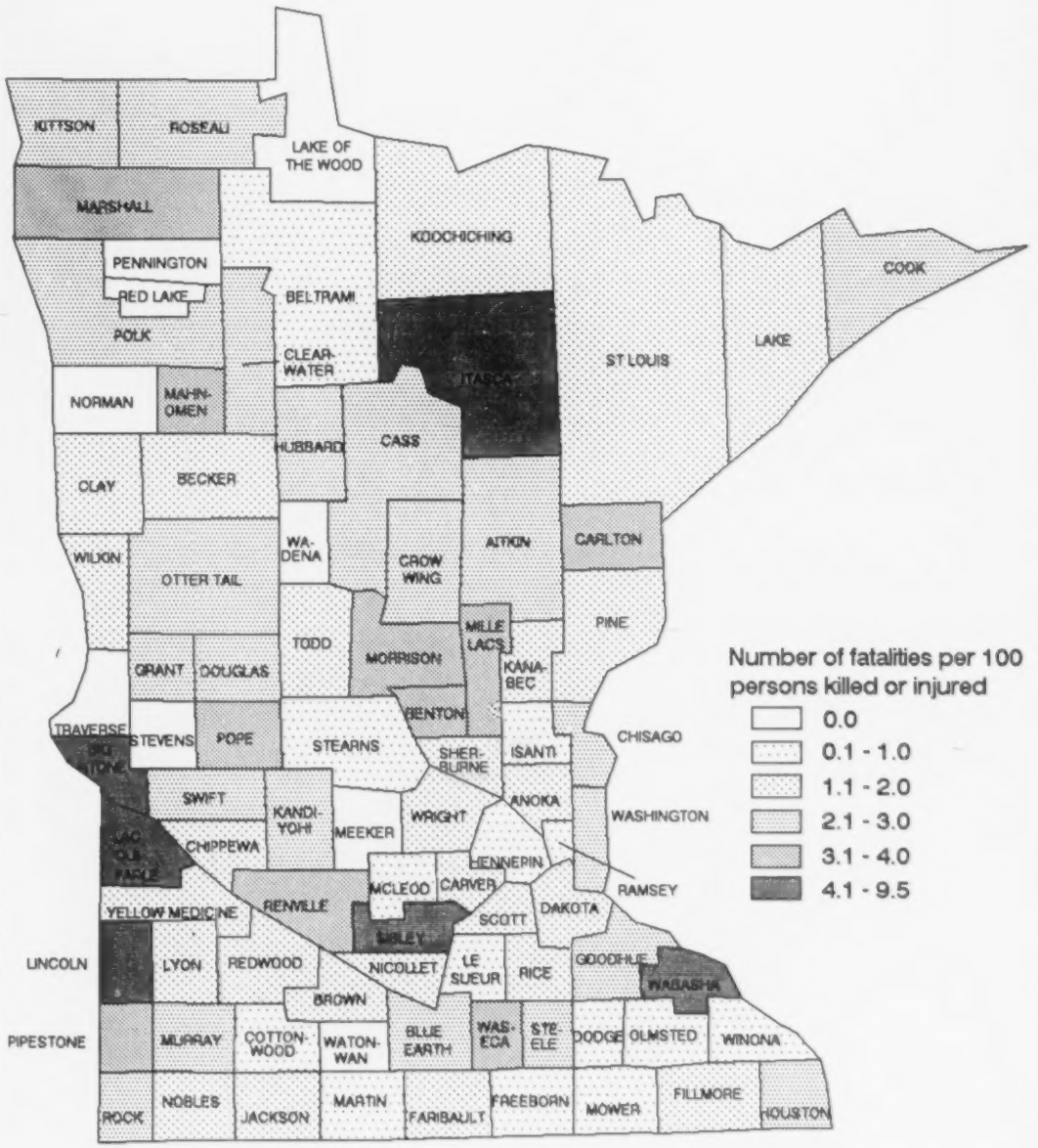


TABLE 1.26

1990 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Afton	0	25	65	90	0	33
Albert Lea	0	102	260	362	0	139
Alexandria	0	95	277	372	0	125
Andover	1	58	124	183	1	88
Anoka	0	171	450	621	0	257
Apple Valley	0	132	273	405	0	194
Arden Hills	1	87	213	301	1	121
Aurora	0	5	20	25	0	6
Austin	0	110	339	449	0	153
Baxter	1	25	33	59	1	54
Bayport	0	6	21	27	0	8
Belle Plaine	0	8	40	48	0	12
Bemidji	0	84	286	370	0	115
Benson	0	8	28	36	0	8
Big Lake	0	11	27	38	0	14
Blaine	5	326	578	909	6	517
Bloomington	6	742	1,769	2,517	6	1,014
Blue Earth	0	18	55	73	0	26
Brainerd	2	112	311	425	2	155
Breckenridge	0	15	53	68	0	23
Brooklyn Center	1	270	551	822	1	388
Brooklyn Park	3	480	605	1,088	3	687
Buffalo	0	43	120	163	0	50
Burnsville	4	266	683	953	5	381
Caledonia	0	4	24	28	0	5
Cambridge	1	43	87	131	1	66
Cannon Falls	1	8	43	52	1	13
Champlin	0	78	131	209	0	109
Chanhassen	1	114	197	312	1	210
Chaska	1	63	140	204	1	87
Chisholm	1	17	40	58	1	30
Circle Pines	1	20	32	53	1	28
Cloquet	2	59	151	212	2	88
Columbia Heights	2	124	210	336	2	181
Coon Rapids	4	394	669	1,067	4	580
Corcoran	1	25	39	65	2	37
Cottage Grove	3	95	226	324	4	155
Crookston	0	41	97	138	0	68
Crystal	0	137	211	348	0	199
Dayton	0	13	58	71	0	19
Deephaven	0	3	26	29	0	3
Delano	1	12	45	58	1	19
Detroit Lakes	0	57	108	165	0	73

TABLE 1.26 CONTINUED

1990 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Dilworth	0	9	12	21	0	17
Duluth	4	519	1,129	1,652	4	710
Eagan	1	180	510	691	1	243
East Bethel	1	35	94	130	1	57
East Grand Forks	0	40	97	137	0	52
Eden Prairie	3	250	621	874	3	341
Edina	1	270	658	929	1	371
Elk River	3	77	143	223	3	142
Ely	0	10	41	51	0	12
Eveleth	1	23	69	93	1	35
Excelsior	0	11	25	36	0	16
Fairmont	0	78	170	248	0	110
Falcon Heights	0	39	75	114	0	58
Faribault	1	140	275	416	1	195
Farmington	0	31	75	106	0	45
Fergus Falls	0	63	176	239	0	94
Forest Lake	1	48	101	150	1	88
Fridley	0	204	342	546	0	301
Gilbert	0	9	14	23	0	11
Glencoe	0	21	53	74	0	35
Glenwood	0	7	31	38	0	8
Golden Valley	1	288	633	922	1	396
Goodview	0	8	16	24	0	9
Grand Rapids	1	72	170	243	1	93
Granite Falls	0	12	24	36	0	19
Ham Lake	3	54	94	151	3	97
Hastings	1	79	188	268	1	118
Hermantown	1	34	68	103	1	53
Hibbing	1	120	272	393	1	161
Hopkins	1	134	256	391	1	158
Hoyt Lakes	0	6	11	17	0	9
Hugo	0	20	68	88	0	30
Hutchinson	0	58	184	242	0	84
Independence	0	35	55	90	0	50
International Falls	0	65	132	197	0	102
Inver Grove Heights	3	100	256	359	3	150
Jackson	0	16	37	53	0	33
Jordan	0	10	28	38	0	17
Kasson	0	5	23	28	0	8
La Crescent	0	13	38	51	0	21
Lake City	0	24	58	82	0	31
Lake Elmo	0	35	90	125	0	67
Lakeville	5	102	236	343	5	156

TABLE 1.26 CONTINUED

1990 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Lauderdale	0	26	36	62	0	41
Le Sueur	0	15	50	65	0	19
Lino Lakes	2	56	149	207	2	84
Litchfield	0	36	91	127	0	52
Little Canada	2	96	250	348	2	124
Little Falls	0	43	111	154	0	61
Long Prairie	1	10	27	38	1	20
Luverne	0	19	39	58	0	27
Mahtomedi	0	19	33	52	0	28
Mankato	2	226	713	941	2	285
Maple Grove	6	155	345	506	7	212
Maplewood	3	295	625	923	3	424
Marshall	0	48	93	141	0	66
Medina	0	15	78	93	0	22
Melrose	1	6	20	27	1	6
Mendota Heights	0	49	147	196	0	58
Minneapolis	26	4,478	9,824	14,328	26	6,106
Minnetonka	0	320	602	922	0	440
Minnetrista	1	29	89	119	1	41
Montevideo	0	41	66	107	0	58
Monticello	0	52	82	134	0	84
Moorhead	3	185	550	738	3	258
Mora	0	13	35	48	0	23
Morris	0	17	72	89	0	26
Mound	0	25	52	77	0	32
Mounds View	0	60	136	196	0	88
Mountain Iron	0	13	27	40	0	24
New Brighton	1	113	256	370	2	153
New Hope	0	90	173	263	0	121
Newport	2	50	125	177	3	71
New Prague	0	11	48	59	0	14
New Ulm	1	73	182	256	1	122
Northfield	1	45	87	133	1	59
North Mankato	0	29	100	129	0	37
North Oaks	0	18	56	74	0	28
North St. Paul	0	71	194	265	0	102
Oakdale	0	68	161	229	0	98
Oak Park Heights	1	19	34	54	1	31
Olivia	0	4	33	37	0	5
Orono	0	65	144	209	0	84
Ortonville	0	8	24	32	0	11
Osseo	2	27	51	80	2	42
Owatonna	0	89	341	430	0	115

TABLE 1.26 CONTINUED

1990 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Park Rapids	0	17	47	64	0	22
Pine City	0	20	40	60	0	37
Pipestone	0	19	48	67	0	25
Plainview	1	8	24	33	2	10
Plymouth	1	232	508	741	1	325
Princeton	0	33	69	102	0	45
Prior Lake	2	53	68	123	2	89
Proctor	0	6	13	19	0	9
Ramsey	2	74	133	209	2	126
Red Wing	2	110	284	396	2	164
Redwood Falls	0	20	47	67	0	32
Richfield	2	305	827	1,134	2	414
Robbinsdale	2	126	227	355	2	150
Rochester	2	447	1,181	1,630	2	620
Rockford	0	10	24	34	0	13
Rosemount	0	62	112	174	0	88
Roseville	1	285	655	941	1	397
St. Anthony	0	39	72	111	0	52
St. Cloud	1	521	1,232	1,754	1	741
St. James	0	20	42	62	0	24
St. Joseph	0	10	34	44	0	12
St. Louis Park	5	333	702	1,040	5	453
St. Michael	0	4	18	22	0	9
St. Paul	19	2,537	7,141	9,697	20	3,437
St. Paul Park	0	10	30	40	0	14
St. Peter	1	26	78	105	1	31
Sartell	0	21	28	49	0	32
Sauk Centre	0	6	52	58	0	9
Sauk Rapids	0	39	106	145	0	51
Savage	2	70	140	212	2	107
Shakopee	0	121	269	390	0	163
Shoreview	0	84	207	291	0	118
Shorewood	0	47	77	124	0	66
Silver Bay	0	15	7	22	0	20
Sleepy Eye	0	18	47	65	0	27
South Interntl. Falls	0	0	1	1	0	0
South St. Paul	3	107	259	369	3	140
Spring Lake Park	2	50	91	143	3	73
Spring Valley	0	8	29	37	0	15
Staples	0	14	49	63	0	19
Stewartville	0	11	34	45	0	14
Stillwater	2	59	243	304	5	91
Thief River Falls	0	77	125	202	0	100

TABLE 1.26 CONTINUED

1990 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Two Harbors	0	8	49	57	0	10
Vadnais Heights	1	68	212	281	1	86
Virginia	0	51	168	219	0	66
Waconia	0	18	54	72	0	28
Wadena	0	28	75	103	0	38
Waite Park	0	53	164	217	0	74
Waseca	0	35	118	153	0	50
Wayzata	0	48	150	198	0	65
Wells	0	7	17	24	0	9
West St. Paul	0	139	221	360	0	194
White Bear Lake	0	173	343	516	0	264
Willmar	1	145	327	473	1	216
Windom	1	30	45	76	1	42
Winona	0	191	487	678	0	283
Woodbury	3	83	173	259	4	122
Worthington	0	53	173	226	0	79

TABLE 1.27

1990 CRASHES BY TIME AND DAY

Hour Beginning	Total Crashes	Fatal Crashes	Sunday All	Sunday Fatal	Monday All	Monday Fatal	Tuesday All	Tuesday Fatal	Wednesday All	Wednesday Fatal	Thursday All	Thursday Fatal	Friday All	Friday Fatal	Saturday All	Saturday Fatal
Midnight	1,929	29	449	8	162	3	132	1	153	0	224	3	217	4	592	10
1:00	2,737	31	763	7	190	1	171	2	205	0	309	3	309	4	790	14
2:00	1,607	19	423	6	115	2	100	0	124	0	187	1	169	3	489	7
3:00	961	20	271	6	80	1	47	3	64	0	82	1	100	0	317	9
4:00	718	5	211	0	55	1	55	1	57	0	70	1	82	1	188	1
5:00	979	12	187	3	113	1	108	2	141	1	126	0	119	1	185	4
6:00	2,150	16	152	2	371	1	312	2	401	1	356	6	333	2	225	2
7:00	4,626	18	172	0	828	2	842	4	868	0	786	3	832	5	298	4
8:00	4,030	17	203	1	717	1	636	1	724	4	645	3	633	4	472	3
9:00	3,379	14	300	3	540	3	459	2	494	0	436	1	521	3	629	2
10:00	4,008	12	418	1	603	5	396	1	541	0	546	0	629	2	875	3
11:00	4,996	26	466	4	723	4	606	4	664	2	655	1	892	3	990	8
Noon	5,665	24	644	2	757	4	602	3	785	3	779	4	1,028	5	1,070	3
1:00	5,295	19	539	0	766	4	608	3	706	4	750	2	955	3	971	3
2:00	5,947	27	587	4	876	3	797	5	819	3	851	5	1,131	6	886	1
3:00	7,308	18	604	0	1,126	3	1,012	0	1,093	5	1,175	3	1,475	5	823	2
4:00	7,448	25	616	1	990	2	1,192	4	1,173	2	1,272	7	1,466	6	739	3
5:00	7,766	23	619	1	1,055	4	1,365	4	1,195	2	1,282	5	1,477	2	773	5
6:00	5,474	29	532	6	670	3	842	2	851	7	801	3	1,027	4	751	4
7:00	4,500	26	538	4	493	5	589	1	650	4	647	4	884	4	699	4
8:00	3,700	15	410	1	400	2	466	3	547	3	534	1	733	1	610	4
9:00	3,870	24	412	3	420	1	521	2	540	2	537	3	785	7	655	6
10:00	3,273	22	366	0	314	2	368	1	432	3	453	3	758	4	582	9
11:00	2,891	23	268	3	262	2	293	3	348	1	358	3	789	7	573	4
Unknown	3,979	9	427	1	527	0	512	0	545	2	602	2	695	1	671	3
Total	99,236	503	10,577	67	13,153	60	13,031	54	14,120	49	14,463	68	18,039	87	15,853	118

FIGURE 1.05

Fatal Crashes vs. Total Crashes, by Time, 1990

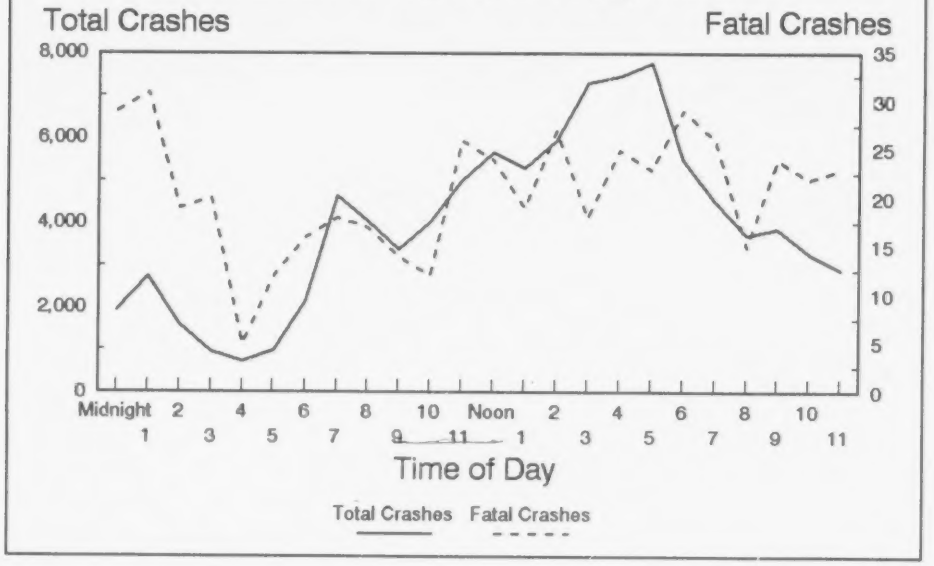


TABLE 1.28

1990 CRASHES. FATALITIES, AND INJURIES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	35	1,898	5,350	7,283	37	2,684
February	35	1,980	5,801	7,816	41	2,845
March	17	1,983	4,889	6,889	21	2,925
April	33	2,243	4,395	6,671	36	3,213
May	37	2,787	5,356	8,180	41	4,005
June	38	3,189	5,853	9,080	43	4,750
July	61	3,003	5,170	8,234	70	4,401
August	55	2,792	5,053	7,900	61	4,044
September	57	2,707	4,856	7,620	65	3,990
October	33	2,655	5,809	8,497	36	3,906
November	58	2,530	6,695	9,283	64	3,732
December	44	2,917	8,822	11,783	53	4,139
Total	503	30,684	68,049	99,236	568	44,634

TABLE 1.29

HOLIDAY CRASH SUMMARY, 1986 - 1990

Holiday Period	Year	Hours*	Total Crashes	Fatal Crashes	Personal Injury Crashes	Killed	Injured
Memorial Day	1986	78	855	9	285	11	421
(For 1990, the holiday	1987	78	695	4	238	4	384
period was 6 PM Fri.,	1988	78	691	8	243	8	369
May 25 - midnight	1989	78	749	7	288	7	426
Mon., May 28)	1990	78	861	4	310	4	497
July 4th	1986	78	751	4	278	5	469
(For 1990, the holiday	1987	78	834	6	319	7	500
period was 6 PM Tues.,	1988	78	717	8	282	8	458
July 3 - midnight	1989	102	1,079	13	439	14	708
Wed., July 4)	1990	30	351	2	142	2	216
Labor Day	1986	78	800	8	280	8	446
(For 1990, the holiday	1987	78	711	5	258	5	406
period was 6 PM Fri.,	1988	78	764	9	271	12	416
Aug. 31 - midnight	1989	78	801	4	289	4	413
Mon., Sept. 3)	1990	78	713	8	307	10	486
Thanksgiving	1986	102	838	13	192	15	323
(For 1990, the holiday	1987	102	1,522	7	441	10	690
period was 6 PM Wed.,	1988	102	1,580	8	386	8	595
Nov. 21 - midnight	1989	102	1,180	6	313	6	482
Sun., Nov. 25)	1990	102	845	8	237	11	377
Christmas	1986	30	130	3	35	3	48
(For 1990, the holiday	1987	78	648	2	164	2	260
period was 6 PM Fri.,	1988	78	1,052	1	247	1	406
Dec. 21 - midnight	1989	78	1,247	7	347	8	518
Tues., Dec. 25)	1990	102	1,907	2	443	3	662
New Year's							
(For 1990/91, the	1986/87	30	199	0	56	0	84
holiday period was	1987/88	30	744	5	208	6	355
6 PM Fri., Dec. 28,	1988/89	78	823	4	219	4	335
1990 - midnight Tues.,	1989/90	78	972	5	248	5	398
Jan. 1, 1991)	1990/91	102	**	4	**	4	**

* Holiday period hours vary depending on the day of the week on which the holiday falls.

** Information on non-fatal crashes during the 1990/91 New Year's holiday period is not yet available.

II: ALCOHOL-RELATED CRASHES

The 1980s saw a decrease in the percentage of drivers who were killed who tested positive for alcohol. This number declined until the mid-80s, then reached a plateau at around 50%. The percentage of drivers who were killed who were legally intoxicated also followed this pattern and has reached a plateau at around 40%. Minnesota law requires alcohol testing of any driver or pedestrian, 16 years of age or older, who dies within 4 hours as a result of a traffic crash.

In September of 1986, the drinking age was raised from 19 to 21, but the law was phased in. The last year anyone under the age of 21 could legally drink was 1988; everyone had to be 21 in 1990.

"Alcohol-related" defined

In the case of fatal crashes and fatalities, both the investigating officer's perception of alcohol involvement as well as the alcohol test results for any driver, pedestrian or bicyclist involved in the crash are used. In the case of injury crashes, injuries, and property damage crashes, we use only the officer's perception of alcohol involvement. Thus, the number of alcohol-related injury crashes, injuries and property damage crashes are probably underestimated.

Driver testing low in 1990

There were 334 drivers killed and of these 260 were tested for alcohol concentration. This is only 78% tested for alcohol. Of those tested, 50% were drinking and 42% were over the legal limit. These numbers are in line with recent years. Some reasons for a lower percent tested could be: the driver did not die within 4 hours of the crash, drivers were under the age of 16, or some reports have yet to be filed.

DWI arrests concentrated among young

The number of DWI arrests could reach an all time high in 1990. (The figures for the city of Minneapolis were not available in time for publication so have not yet been added.) Twelve percent of those arrested for DWI were under the legal drinking age. Twenty-three percent were between the ages of 25 and 29, and 71% were under the age of 35.

Alcohol-related casualties mainly young

There were 235 persons killed and 6,762 persons injured in alcohol-related crashes in 1990. Of these, 72% of fatalities and 73% of injuries were under age 35. Almost a quarter of the injuries and fatalities were to people between the ages of 20 and 24.

Majority of alcohol-related fatalities drivers

Of the 235 alcohol-related fatalities, 64% were drivers, 23% were passengers, 11% were pedestrians, the other 2% consisted of 1 bicyclist and 4 whose traffic role was unknown. At least 73% of all those who died in alcohol-related traffic crashes had themselves been drinking.

Alcohol-related fatal crashes more likely to be single vehicle

Alcohol-related fatal crashes were much more likely to be collisions with fixed objects or non-collisions than were fatal crashes in general. However, for both groups the most common kind of crash was a collision with another motor vehicle.

Most alcohol-positive also legally intoxicated

Half of the killed drivers tested for alcohol were positive: 42% were also legally intoxicated. One-third of those who were legally intoxicated had concentrations at least twice the legal limit in Minnesota. The 24-29 year-old age group tested positive most often. Of 24-29 year olds tested, 74% had been drinking, and 61% were legally intoxicated. The great majority (84%) of killed drivers who had been drinking continues to be male.

Late nights and week-ends most alcohol-involved

The hours surrounding 1:00 AM have the highest number of alcohol-related crashes. The hours from 4:00 AM to 4:00 PM have relatively few of these crashes. The hours from 6:00 PM to 6:00 AM have the highest percentage of drivers who were killed who were then tested. The period from midnight to 3:00 AM has the highest percentage of drivers who were killed who tested positive for alcohol. Friday, Saturday, and Sunday combined accounted for 64% of the alcohol-related crashes.

TABLE 2.01

DRINKING DRIVER SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Drunken Driving Arrests	27,034	28,048	32,155	36,638	35,383	36,390	34,664	32,827	34,562	*35,171*[1]
% Male	88%	87%	86%	86%	85%	85%	84%	84%	84%	*83%*
% Female	12%	13%	14%	14%	15%	15%	16%	16%	16%	*17%*
Alcohol-Related Driver License Revocations Processed[2]	32,043	36,024	41,311	43,502	40,807	42,586	40,899	37,530	38,619	42,470
Estimated Alcohol Incidents that Led to Revocation[3]						39,310	37,710	34,270	35,470	38,785
Administrative Revocations For Refusing Test	4,427	8,456	11,155	11,413	9,219	8,468	8,336	7,907	7,943	8,354
Drivers Killed	437	321	345	383	372	347	297	361	368	334
Tested	66%	72%	75%	83%	79%	81%	89%	87%	85%	78%
Positive (.01 or higher)	62%	54%	56%	58%	47%	49%	50%	48%	50%	50%
Drunk (.10 or higher)	52%	48%	45%	47%	37%	41%	43%	38%	41%	42%
Alcohol-Related Fatalities[4]				305	261	264	224	277	275	235
% of Total Fatalities				52%	43%	46%	42%	45%	45%	41%

[1] Drunken driving arrests in the city of Minneapolis were not available in time for publication, so are not included in this total: the final number will be higher.
[2] Total alcohol revocations include certain multiple offenders who are revoked twice, under separate statutes, and those who have their Minnesota driver's license revoked because of an arrest outside of Minnesota.
[3] Estimated number of incidents that led to license revocation. For example: if Pat Doe gets arrested for a second alcohol offense in January and is arrested in June for a third offense, there could be 1 driver, 2 alcohol incidents, and 3 revocations. (These estimates are not available prior to 1986).
[4] Alcohol-related fatalities were defined differently prior to 1984.

TABLE 2.02

DWI ARRESTS BY AGE, 1981 - 1990

Age	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990*
14 & Younger	5	4	7	6	8	8	8	6	8	*3*
15	16	13	21	21	24	27	13	15	25	*12*
16	165	202	169	185	171	254	208	160	175	*156*
17	542	503	546	500	446	546	485	503	458	*423*
18	1,203	1,327	1,284	1,342	1,109	1,151	1,084	1,038	1,072	*934*
19	1,744	1,789	1,983	2,166	1,864	1,813	1,363	1,229	1,284	*1,261*
20	1,752	1,840	2,040	2,370	2,035	2,002	1,709	1,291	1,426	*1,420*
14 & Younger	5	4	7	6	8	8	8	6	8	*3*
15 - 19	3,670	3,834	4,003	4,214	3,614	3,791	3,153	2,945	3,014	*2,786*
20 - 24	7,659	8,213	9,564	11,220	10,289	10,273	9,345	7,933	8,071	*7,998*
25 - 29	5,029	5,229	6,299	7,511	7,618	8,295	8,146	7,920	8,293	*8,245*
30 - 34	3,362	3,450	3,948	4,720	4,933	5,002	5,110	5,146	5,554	*6,057*
35 - 39	2,219	2,273	2,701	3,013	3,200	3,316	3,356	3,265	3,577	*3,816*
40 - 44	1,464	1,589	1,796	2,078	2,062	2,098	2,087	2,101	2,418	*2,505*
45 - 49	1,153	1,119	1,239	1,394	1,292	1,274	1,289	1,360	1,407	*1,435*
50 - 54	916	849	975	916	911	857	834	786	892	*944*
55 - 59	740	688	738	704	686	631	584	556	568	*562*
60 - 64	397	412	471	443	395	397	359	406	389	*400*
65 & Older	420	388	414	419	375	448	393	403	371	*420*
TOTAL	27,034	28,048	32,155	36,638	35,383	36,390	34,664	32,827	34,562	*35,171*

* DWI arrests for the city of Minneapolis were not available in time for publication, so they are not included in the 1990 figures: final numbers will be higher.

"ALCOHOL-RELATED"

The term "alcohol-related" is defined differently for fatal crashes and fatalities than it is for injury crashes, injuries, and property damage crashes.

Alcohol-related fatality: The investigating officer suspected alcohol involvement and/or there was a positive blood test for alcohol for any driver, pedestrian or bicyclist involved in the crash.

Alcohol-related fatal crash: The investigating officer suspected alcohol involvement and/or there was a positive blood test for alcohol for any driver, pedestrian or bicyclist involved in the crash.

Alcohol-related injury crash/injury: The investigating officer suspected alcohol involvement for any driver, pedestrian or bicyclist involved in the crash. Since only the officer's perception is used in this definition, alcohol-related injury crashes and injuries are probably underestimated.

Alcohol-related property damage crash: The investigating officer suspected alcohol involvement for any driver, pedestrian or bicyclist involved in the crash. Since only the officer's perception is used in this definition, alcohol-related property damage crashes are probably underestimated.

TABLE 2.03

AGE OF PERSONS KILLED AND INJURED IN 1990 ALCOHOL-RELATED CRASHES

Age	Killed[1]	Injured[2]
0 - 4	1	75
5 - 9	0	89
10 - 14	1	100
15 - 19	35	1,232
20 - 24	58	1,528
25 - 29	34	1,143
30 - 34	41	796
35 - 39	25	508
40 - 44	14	305
45 - 49	6	164
50 - 54	7	149
55 - 59	5	99
60 - 64	4	63
65 - 69	2	41
70 - 74	1	41
75 - 79	1	22
80 - 84	0	9
85 & Older	0	4
Not Stated	0	394
Total	235*	6,762

1 Includes alcohol test information as well as officer's perception of alcohol noted on accident report.
2 Includes only police officer's perception of alcohol noted on accident report.

* Sixteen of the 235 alcohol-related fatalities were pedestrians who had been drinking. In 3 of these 16 cases, the motor vehicle driver had also been drinking.

TABLE 2.04

1990 ALCOHOL-RELATED FATALITIES' LEVEL OF INTOXICATION BY TRAFFIC ROLE

Traffic Role	Killed	Tested	Drinking (.01 or more)	Drunk (.10 or more)
Car or Truck Driver	122	114	104	87
Car or Truck Passenger	49	22	19	14
Motorcycle Driver	26	25	25	20
Motorcycle Passenger	5	3	3	1
Pedestrian	25	20	16	15
Bicyclist	1	0	0	0
All-Terrain Vehicle Driver	1	1	1	0
Snowmobile Driver	1	1	1	1
Other Driver	1	0	0	0
Other/Unknown	4	4	3	3
Total	235	190	172	141

TABLE 2.05

PERCENT OF DEATHS, INJURIES, AND PROPERTY DAMAGE CRASHES DETERMINED TO BE ALCOHOL-RELATED, 1984 - 1990

	1984	1985	1986	1987	1988	1989	1990
Deaths*	52%	43%	46%	42%	45%	45%	41%
Injuries**	19%	16%	17%	17%	15%	15%	15%
Property Damage Crashes**	7%	6%	7%	7%	5%	5%	6%

* Includes alcohol test information as well as officer's perception of alcohol noted on accident report.
**Includes only police officer's perception of alcohol noted on accident report.

FIGURE 2.01
1990 Alcohol-Related Crashes by Time of Day

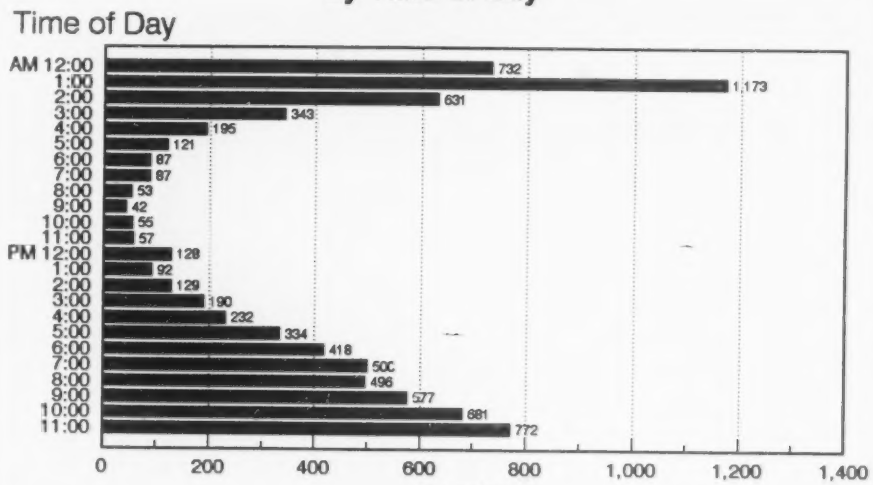


FIGURE 2.02
1990 Alcohol-Related Crashes by Day of Week

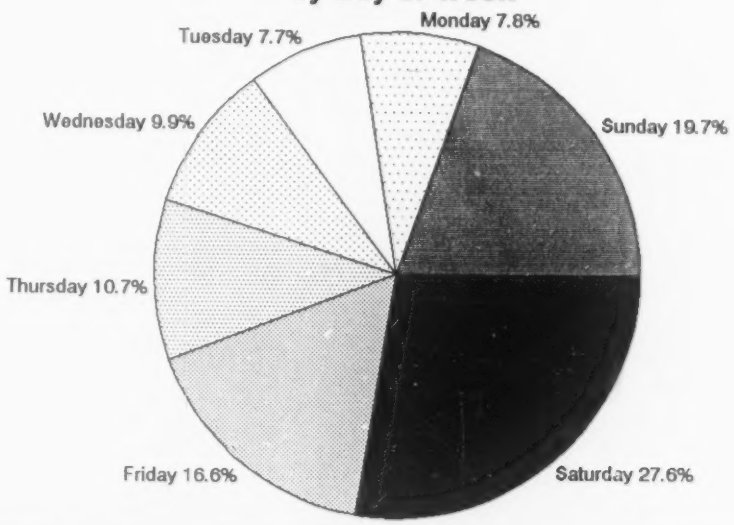


TABLE 2.06

ALCOHOL-RELATED* FATAL CRASHES BY FIRST HARMFUL EVENT, 1990

First Harmful Event	Alcohol-Related Fatal Crashes Number	Percent	All Fatal Crashes Number	Percent
Collision with:				
Another Motor Vehicle	62	30.2%	233	46.3%
Parked Motor Vehicle	4	2.0	5	1.0
Railroad Train	3	1.5	13	2.6
Bicycle	1	0.5	8	1.6
Pedestrian	24	11.7	62	12.3
Animal	0	0.0	3	0.6
Fixed Object	58	28.3	91	18.1
Other Object	1	0.5	2	0.4
Non-Collision:				
Overturn	46	22.4	74	14.7
Fire/Explosion	2	1.0	2	0.4
Other	4	2.0	10	2.0
Total	205	100.0%	503	100.0%

* Includes alcohol test information as well as officer's perception of alcohol noted on accident report.

TABLE 2.07

TEST RESULTS OF DRIVERS KILLED, 1981 - 1990

Year	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)
1981	437	288	178 (62%)	150 (52%)
1982	321	232	126 (54%)	112 (48%)
1983	345	258	145 (56%)	117 (45%)
1984	383	318	185 (58%)	149 (47%)
1985	372	295	139 (47%)	108 (37%)
1986	347	281	138 (49%)	114 (41%)
1987	297	265	133 (50%)	115 (43%)
1988	361	313	150 (48%)	118 (38%)
1989	368	313	155 (50%)	129 (41%)
1990	334	260	131 (50%)	108 (42%)

* Percentages are based on number of motor vehicle drivers tested.

TABLE 2.08

DRIVERS KILLED WHO TESTED .01 OR HIGHER, 1981 - 1990
("Drinking")

Year	Total	Male	Female	Occurred Between Midnight - 3 AM	Under Legal Age
1981	178	162 (91%)	16 (9%)	61 (34%)	17 (10%)
1982	126	116 (92%)	10 (8%)	41 (33%)	9 (7%)
1983	145	129 (89%)	16 (11%)	38 (26%)	13 (9%)
1984	185	163 (88%)	22 (12%)	63 (34%)	17 (9%)
1985	139	116 (83%)	23 (17%)	60 (43%)	14 (10%)
1986	138	117 (85%)	21 (15%)	50 (36%)	16 (12%)*
1987	133	112 (84%)	21 (16%)	34 (26%)	22 (17%)
1988	150	131 (87%)	19 (13%)	32 (21%)	34 (23%)
1989	155	138 (89%)	17 (11%)	47 (30%)	26 (17%)
1990	131	110 (84%)	21 (16%)	48 (37%)	28 (21%)

* On September 1, 1986, the drinking age was raised from 19 to 21.

TABLE 2.09

DRIVERS KILLED WHO TESTED .10 OR HIGHER, 1981 - 1990
("Drunk")

Year	Total	Male	Female	Occurred Between Midnight - 3 AM	Under Legal Age
1981	150	138 (92%)	12 (8%)	81 (54%)	15 (10%)
1982	112	102 (91%)	10 (9%)	41 (37%)	7 (6%)
1983	117	105 (90%)	12 (10%)	38 (32%)	8 (7%)
1984	149	132 (89%)	17 (11%)	50 (34%)	12 (8%)
1985	108	90 (83%)	18 (17%)	49 (45%)	6 (6%)
1986	114	100 (88%)	14 (12%)	42 (37%)	12 (11%)*
1987	115	98 (85%)	17 (15%)	33 (29%)	13 (11%)
1988	118	100 (85%)	18 (15%)	27 (23%)	22 (19%)
1989	129	117 (91%)	12 (9%)	42 (33%)	19 (15%)
1990	108	92 (85%)	16 (15%)	42 (39%)	22 (20%)

* On September 1, 1986, the drinking age was raised from 19 to 21.

FIGURE 2.03

Drivers Killed Who Had Been Drinking
1981 - 1990

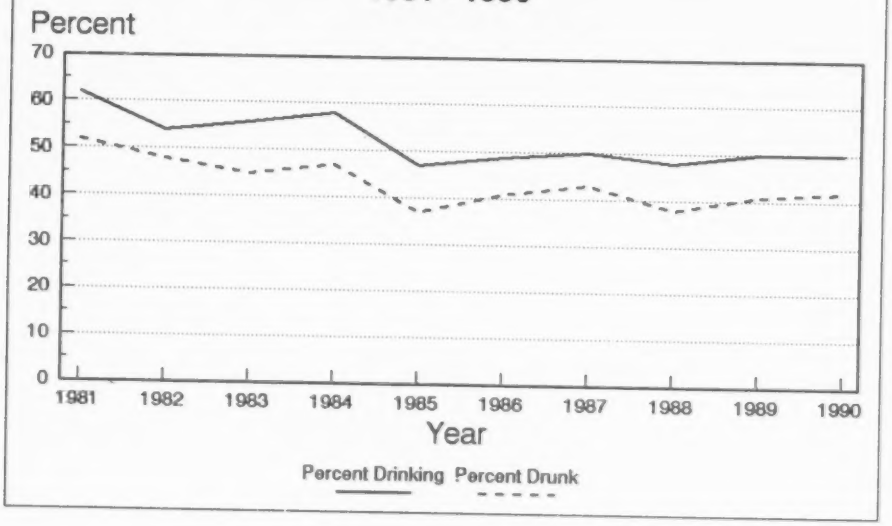


FIGURE 2.04

Percent of Drivers Killed Who Had Been Drinking, by Age, 1990

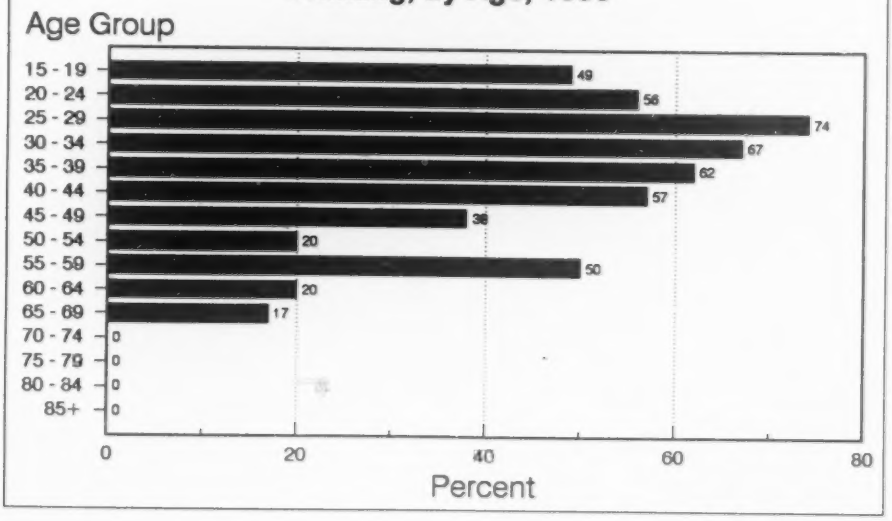


TABLE 2.10

1990 DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY AGE

Age	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)	Alcohol Concentration .01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
14 & Younger	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	4	3	1	0	0	1	0	0	0	0
17	18	13	5	4	1	0	1	3	0	0
18	10	8	4	4	0	0	1	3	0	0
19	16	15	9	7	1	1	3	3	1	0
20	18	17	9	7	1	1	3	2	1	1
14 & Younger	0	0	0	0	0	0	0	0	0	0
15 - 19	48	39	19 (49%)	15 (38%)	2	2	5	9	1	0
20 - 24	65	59	33 (56%)	29 (49%)	1	3	6	11	6	6
25 - 29	37	31	23 (74%)	19 (61%)	2	2	3	3	9	4
30 - 34	39	30	20 (67%)	16 (53%)	0	4	0	5	6	5
35 - 39	27	21	13 (62%)	12 (57%)	1	0	2	5	1	4
40 - 44	24	21	12 (57%)	11 (52%)	0	1	1	1	5	4
45 - 49	11	8	3 (38%)	3 (38%)	0	0	0	1	2	0
50 - 54	16	10	2 (20%)	0 (0%)	1	1	0	0	0	0
55 - 59	9	8	4 (50%)	2 (25%)	2	0	0	0	1	1
60 - 64	9	5	1 (20%)	0 (0%)	1	0	0	0	0	0
65 - 69	8	6	1 (17%)	1 (17%)	0	0	1	0	0	0
70 - 74	14	5	0 (0%)	0 (0%)	0	0	0	0	0	0
75 - 79	12	7	0 (0%)	0 (0%)	0	0	0	0	0	0
80 - 84	9	8	0 (0%)	0 (0%)	0	0	0	0	0	0
85 & Older	6	2	0 (0%)	0 (0%)	0	0	0	0	0	0
Total	334	260	131 (50%)	108 (42%)	10	13	18	35	31	24

* Percentages are based on number of motor vehicle drivers tested.

TABLE 2.11

1990 DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY MONTH

Month	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)	Alcohol Concentration .01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
January	26	23	13 (57%)	11 (48%)	1	1	2	4	3	2
February	27	20	11 (55%)	8 (40%)	1	2	1	2	1	4
March	14	11	2 (18%)	2 (18%)	0	0	1	0	1	0
April	15	12	5 (42%)	5 (42%)	0	0	1	3	0	1
May	25	21	11 (52%)	10 (48%)	1	0	1	2	3	4
June	24	17	10 (59%)	7 (41%)	1	2	0	3	2	2
July	37	29	15 (52%)	14 (48%)	0	1	3	4	6	1
August	39	30	19 (63%)	15 (50%)	0	4	2	8	5	0
September	40	38	25 (66%)	21 (55%)	3	1	2	5	6	8
October	19	16	5 (31%)	4 (25%)	1	0	1	0	2	1
November	36	24	10 (42%)	8 (33%)	2	0	4	2	1	1
December	32	19	5 (26%)	3 (16%)	0	2	0	2	1	0
Total	334	260	131 (50%)	108 (42%)	10	13	18	35	31	24

* Percentages are based on number of motor vehicle drivers tested.

TABLE 2.12

1990 DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY ROAD TYPE

Road Type	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)	Alcohol Concentration .01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
Urban Interstate	20	17	10 (59%)	8 (47%)	1	1	1	3	3	1
Rural Interstate	12	9	4 (44%)	3 (33%)	0	1	1	0	0	2
Urban Trunk Highway	36	27	11 (41%)	9 (33%)	1	1	2	4	2	1
Rural Trunk Highway	107	83	37 (45%)	30 (36%)	2	5	7	3	9	11
County State Aid Highway	101	78	43 (55%)	37 (47%)	3	3	6	16	11	4
County Road	13	10	6 (60%)	5 (50%)	1	0	1	1	1	2
Township Road	20	14	8 (57%)	7 (50%)	1	0	0	4	2	1
Local Street	25	22	12 (55%)	9 (41%)	1	2	0	4	3	2
Total	334	260	131 (50%)	108 (42%)	10	13	18	35	31	24

* Percentages are based on the number of motor vehicle drivers tested.

TABLE 2.13

1990 DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY TIME OF DAY

Time of Day	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)	Alcohol Concentration .01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
Midnight - 2:59 AM	62	54	48 (89%)	42 (78%)	1	5	7	13	13	9
3:00 - 5:59 AM	27	23	16 (70%)	15 (65%)	0	1	3	6	3	3
6:00 - 8:59 AM	34	25	4 (16%)	1 (4%)	2	1	0	1	0	0
9:00 - 11:59 AM	28	16	1 (6%)	0 (0%)	1	0	0	0	0	0
Noon - 2:59 PM	40	26	0 (0%)	0 (0%)	0	0	0	0	0	0
3:00 - 5:59 PM	48	36	9 (25%)	8 (22%)	1	0	2	0	4	2
6:00 - 8:59 PM	41	35	19 (54%)	13 (37%)	4	2	2	5	3	3
9:00 - 11:59 PM	46	38	27 (71%)	23 (61%)	1	3	3	7	6	7
Unknown	8	7	7(100%)	6 (86%)	0	1	1	3	2	0
Total	334	260	131 (50%)	108 (42%)	10	13	18	35	31	24

* Percentages are based on the number of motor vehicle drivers tested

TABLE 2.14

1990 DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY DAY OF WEEK

Day of Week	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)	Alcohol Concentration .01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
Sunday	43	34	22 (65%)	18 (53%)	1	3	1	8	5	4
Monday	45	33	10 (30%)	8 (24%)	2	0	3	1	1	3
Tuesday	34	25	12 (48%)	11 (44%)	0	1	2	3	3	3
Wednesday	33	24	9 (38%)	6 (25%)	2	1	1	3	0	2
Thursday	45	41	14 (34%)	11 (27%)	1	2	2	3	2	4
Friday	60	41	19 (46%)	15 (37%)	2	2	1	5	6	3
Saturday	74	62	45 (73%)	39 (63%)	2	4	8	12	14	5
Total	334	260	131 (50%)	108 (42%)	10	13	18	35	31	24

* Percentages are based on number of motor vehicle drivers tested.

III: SAFETY EQUIPMENT USE BY VEHICLE OCCUPANTS IN 1990 CRASHES

Studies show that using safety belts or other passenger protection systems in vehicles reduces the chance of death and serious injury by forty to fifty percent. Cars and trucks are normally equipped with such systems. The most common system is safety belts, which includes both lap and shoulder belts in a two- or three-point configuration. Safety belts might be automatically or manually operated. Many new cars also have airbags on the driver side and some have front seat passenger side airbags as well. There are also child safety seats which parents must use for infants under four years of age, and booster seats are available for young children who have outgrown the safety seats.

If everyone in the state properly used safety restraint devices every time they rode in a vehicle, the numbers of deaths and serious injuries due to crashes would be about half what they would be if no one in the state used safety equipment. In view of the safety benefits, the Legislature enacted laws to require safety equipment use. The Minnesota Child Passenger Protection Act took effect in 1982. As amended in 1983 and 1987, it requires children under four to be properly restrained in an approved child safety seat.

The Legislature passed a mandatory seat belt law in 1986. The law went into effect on August 1, 1986, but there was no penalty for violating the law. A $10 fine was added, effective May 1, 1988. Only secondary enforcement is allowed, which means that a vehicle must be stopped for some other moving traffic violation before a seat belt ticket can be written.

Safety belt use responds to legislation

Observational surveys of vehicles on randomly sampled state roadways have been conducted since 1986. Results suggest that usage rates fall into three stages, with changes from one to the next coincident with changes in the law. In June, 1986 (before the initial safety belt law), 20% of observed front seat occupants wore safety belts. After the law took effect, usage increased to about 32%. After the fine was added, it increased to almost 50%. In August, 1990, it was 47%. That average, though, conceals a higher rate in the metro area (54%) than in the non-metro area (42%).

Almost 40,000 occupants killed or injured

In 1990, 431 people died and 39,472 were injured in vehicles normally equipped with passenger protection systems. For over a quarter (26%) of these people, the investigating officer did not determine whether safety equipment was used. Almost a third (32%) were determined not to have been using safety equipment at the time of the crash.

Use is higher among infants, older persons

Among the killed and injured persons, children under four years of age were likely to have been in child safety seats, and more than half of the people over 40 had been using safety belts. Usage was lowest (only 32%) among those from 11 to 19 years of age.

Use is higher on bigger highways

Safety belt use is in the range of 43% to 47% on bigger highways such as interstates, federal and state trunk highways, and county state-aid highways. It falls belows the 40% level on smaller roads, such as county and township roads and local streets.

Use is higher in eastern part of the state

Counties in the eastern part of the state showed use rates above 40%, compared to use rates below that level among persons killed or injured in crashes occurring in counties in the western part of the state.

TABLE 3.01

MOTOR VEHICLE OCCUPANTS KILLED OR INJURED, BY AGE AND SEVERITY OF INJURY, 1990

Age Group	Killed	Injured			
		Severe	Moderate	Minor	Total
0 - 4	7	65	322	660	1,047
5 - 9	7	80	386	630	1,096
10 - 14	7	114	428	637	1,179
15 - 19	63	773	2,824	3,485	7,082
20 - 24	77	612	2,006	2,961	5,579
25 - 29	36	451	1,497	2,580	4,528
30 - 34	45	339	1,117	2,134	3,590
35 - 39	36	308	875	1,760	2,943
40 - 44	21	215	686	1,386	2,287
45 - 49	17	158	466	930	1,554
50 - 54	23	126	370	760	1,256
55 - 59	10	103	285	607	995
60 - 64	11	117	247	571	935
65 - 69	11	125	294	482	901
70 - 74	18	96	258	393	747
75 - 79	15	76	209	303	588
80 - 84	17	52	126	187	365
85 & Older	9	28	60	74	162
Not Stated	1	98	493	2,047	2,638
Total	431	3,936	12,949	22,587	39,472

FIGURE 3.01

Safety Equipment Use Among Motor Vehicle Occupants Killed and Injured, by Age, 1990

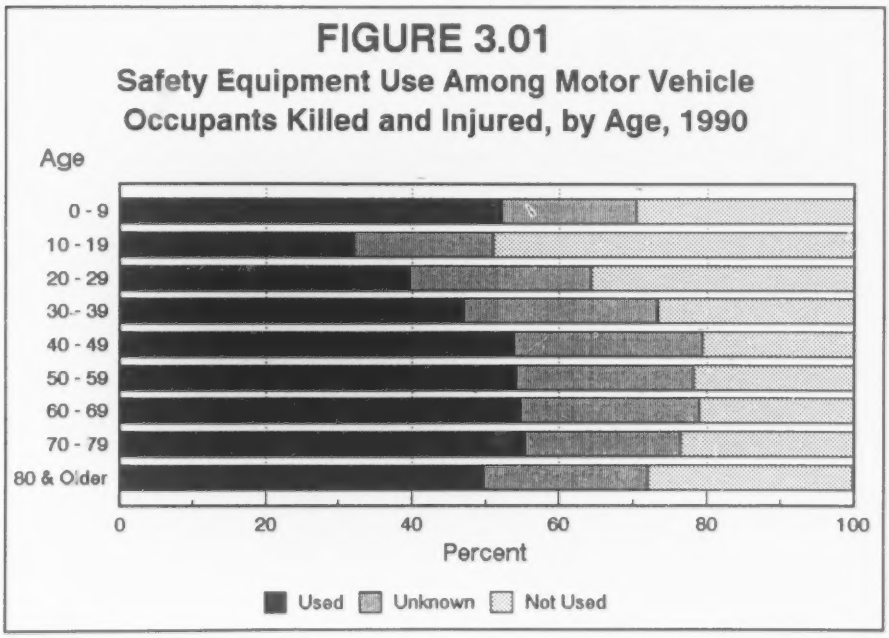


TABLE 3.02

SAFETY EQUIPMENT USE BY VEHICLE OCCUPANTS KILLED OR INJURED, BY AGE AND INJURY SEVERITY, 1990

Age Group	Restraint Use	Killed		Injured							
				Severe		Moderate		Minor		Total	
		#	%	#	%	#	%	#	%	#	%
0 - 3 Years	Used	4	66.7	14	29.8	130	53.5	323	61.1	467	57.0
	Not Used	1	16.7	24	51.1	72	29.6	101	19.1	197	24.1
	Unknown	1	16.7	9	19.1	41	16.9	105	19.8	155	18.9
	Subtotal	6	100.0	47	100.0	243	100.0	529	100.0	819	100.0
4 - 10 Years	Used	3	27.3	42	37.8	257	46.9	444	50.6	743	48.4
	Not Used	6	54.5	54	48.6	210	38.3	257	29.3	521	33.9
	Unknown	2	18.2	15	13.5	81	14.8	176	20.1	272	17.7
	Subtotal	11	100.0	111	100.0	548	100.0	877	100.0	1,536	100.0
11 - 19 Years	Used	6	9.0	179	20.5	986	31.1	1,417	35.4	2,582	32.1
	Not Used	47	70.1	563	64.4	1,696	53.5	1,677	41.9	3,936	48.9
	Unknown	14	20.9	132	15.1	487	15.4	912	22.8	1,531	19.0
	Subtotal	67	100.0	874	100.0	3,169	100.0	4,006	100.0	8,049	100.0
20 - 29 Years	Used	17	15.0	293	27.6	1,279	36.5	2,472	44.6	4,044	40.0
	Not Used	83	73.5	558	52.5	1,556	44.4	1,442	26.0	3,556	35.2
	Unknown	13	11.5	212	19.9	668	19.1	1,627	29.4	2,507	24.8
	Subtotal	113	100.0	1,063	100.0	3,503	100.0	5,541	100.0	10,107	100.0
30 - 39 Years	Used	13	16.0	237	36.6	910	45.7	1,953	50.2	3,100	47.5
	Not Used	63	77.8	279	43.1	705	35.4	687	17.6	1,671	25.6
	Unknown	5	6.2	131	20.2	377	18.9	1,254	32.2	1,762	27.0
	Subtotal	81	100.0	647	100.0	1,992	100.0	3,894	100.0	6,533	100.0
40 - 49 Years	Used	13	34.2	162	43.4	596	51.7	1,314	56.7	2,072	53.9
	Not Used	21	55.3	131	35.1	315	27.3	331	14.3	777	20.2
	Unknown	4	10.5	80	21.4	241	20.9	671	29.0	992	25.8
	Subtotal	38	100.0	373	100.0	1,152	100.0	2,316	100.0	3,841	100.0
50 - 59 Years	Used	7	21.2	107	46.7	346	52.8	775	56.7	1,228	54.6
	Not Used	21	63.6	81	35.4	186	28.4	211	15.4	478	21.2
	Unknown	5	15.2	41	17.9	123	18.8	381	27.9	545	24.2
	Subtotal	33	100.0	229	100.0	655	100.0	1,367	100.0	2,251	100.0
60 - 69 Years	Used	10	45.5	114	47.1	309	57.1	583	55.4	1,006	54.8
	Not Used	11	50.0	85	35.1	136	25.1	158	15.0	379	20.6
	Unknown	1	4.5	43	17.8	96	17.7	312	29.6	451	24.6
	Subtotal	22	100.0	242	100.0	541	100.0	1,053	100.0	1,836	100.0
70 & Older	Used	17	28.8	112	44.4	355	54.4	547	57.2	1,014	54.5
	Not Used	31	52.5	97	38.5	171	26.2	177	18.5	445	23.9
	Unknown	11	18.6	43	17.1	127	19.4	233	24.3	403	21.6
	Subtotal	59	100.0	252	100.0	653	100.0	957	100.0	1,862	100.0
Age Not Stated	Used	0	0.0	25	25.5	153	31.0	409	20.0	587	22.3
	Not Used	0	0.0	34	34.7	159	32.3	181	8.8	374	14.2
	Unknown	1	100.0	39	39.8	181	36.7	1,457	71.2	1,677	63.6
	Subtotal	1	100.0	98	100.0	493	100.0	2,047	100.0	2,638	100.0
All Ages	Used	90	20.9	1,285	32.6	5,321	41.1	10,237	45.3	16,843	42.7
	Not Used	284	65.9	1,906	48.4	5,206	40.2	5,222	23.1	12,334	31.2
	Unknown	57	13.2	745	18.9	2,422	18.7	7,128	31.6	10,295	26.1
	Total	431	100.0	3,936	100.0	12,949	100.0	22,587	100.0	39,472	100.0

(Persons aged 0 through 3 and 4 through 10 years old are categorized in separate groups because Minnesota law makes special provisions for these age groups. Percentages may not sum to 100.0% due to rounding.)

TABLE 3.03

PERCENT OF INJURED OR KILLED MOTOR VEHICLE OCCUPANTS WHO USED SAFETY EQUIPMENT BY INJURY SEVERITY AND YEAR, 1984 - 1990

	1984	1985	1986	1987	1988	1989	1990
Killed							
Used	5.8%	8.8%	9.2%	17.7%	21.1%	20.5%	20.9%
Not Used	64.5	70.8	69.7	67.9	64.1	63.8	65.9
Unknown	29.7	20.4	21.1	14.4	14.8	15.7	13.2
Injured							
Severe Injuries							
Used	5.9	8.4	16.9	22.0	30.5	31.6	32.6
Not Used	46.3	60.3	57.8	55.1	48.9	47.9	48.4
Unknown	47.8	31.3	25.4	22.9	20.6	20.5	18.9
Moderate Injuries							
Used	7.4	10.7	20.8	29.3	38.2	39.9	41.1
Not Used	44.8	58.8	53.4	48.4	41.7	40.6	40.2
Unknown	47.8	30.4	25.9	22.3	20.1	19.5	18.7
Minor Injuries							
Used	9.0	14.4	25.7	36.2	42.9	45.5	45.3
Not Used	34.7	45.6	38.9	32.2	24.4	21.9	23.1
Unknown	56.3	40.1	35.3	31.6	32.7	32.6	31.6
Total Injured							
Used	8.0	12.4	23.0	32.0	39.9	42.3	42.7
Not Used	49.1	54.2	46.5	40.9	32.9	30.7	31.2
Unknown	42.9	33.4	30.5	27.1	27.1	27.0	26.1

TABLE 3.04

SAFETY EQUIPMENT USE BY MOTOR VEHICLE OCCUPANTS KILLED AND INJURED, BY ROADWAY TYPE, 1990

	Used		Not Used		Unknown		Total	
Roadway Type	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Interstate	1,170	46.5	632	25.1	712	28.3	2,514	100.0
Trunk Highway	6,601	45.6	4,562	31.5	3,317	22.9	14,480	100.0
County State-Aid Highway	5,022	42.8	3,699	31.5	3,016	25.7	11,737	100.0
County Road	432	37.3	469	40.5	256	22.1	1,157	100.0
Township Road	343	28.6	638	53.3	217	18.1	1,198	100.0
Local Street	3,339	38.4	2,568	29.5	2,789	32.1	8,696	100.0
Other Road	26	21.5	50	41.3	45	37.2	121	100.0
Total	16,933	42.4	12,618	31.6	10,352	25.9	39,903	100.0

TABLE 3.05

SAFETY EQUIPMENT USE BY MOTOR VEHICLE OCCUPANTS KILLED AND INJURED BY EMS REGION* OF STATE, 1990

EMS Region	Percent Used	Percent Not Used	Percent Unknown	Number of People
Metropolitan	44.2	25.1	30.7	21,880
Central	41.3	38.4	20.3	5,168
Northeast	41.6	36.0	22.4	2,654
Northwest	36.6	45.0	18.4	1,319
South Central	37.9	43.1	19.0	1,587
Southeast	45.5	35.6	18.9	3,569
Southwest	35.1	46.0	18.9	2,149
West Central	35.2	41.3	23.5	1,577
Statewide	42.4	31.6	25.9	39,903

*There are eight Emergency Medical Services (EMS) regions in the state, shown in the map below.

TABLE 3.06

PERCENT OF FRONT SEAT OCCUPANTS WEARING SAFETY BELTS, BY DATE OF OBSERVATION STUDY

	June 1986	August 1986	November 1986	August 1987	August 1988	August 1989	August 1990
Statewide	20%	33%	32%	32%	47%	44%	47%
Metro	30	43	39	40	51	52	54
Non-Metro	15	26	24	28	45	40	42
Weather							
Clear	19	32	33	32	47	44	47
Other	23	36	19	41	48	53	50
Time							
Rush Hour	21	31	30	30	47	42	47
Non-rush Hour	20	34	32	33	47	44	48
Day of the Week							
Weekday	19	33	33	32	45	42	45
Weekend	21	33	29	33	52	49	50
Speed							
20 MPH	14	29	33	29	35	39	46
40 MPH	20	32	27	30	47	46	46
60 MPH	28	39	36	41	57	52	53
Road Class							
Major Roads	23	35	31	35	48	44	49
Local Roads	17	31	32	29	46	45	46

The seat belt law, which requires all front seat passengers and all passengers under the age of eleven to wear safety belts, became effective in Minnesota on August 1, 1986. Only the use of shoulder belts could be observed in the observation studies. The June 1986 study was conducted prior to the implementation of this law; all other studies were conducted after the law went into effect. The August 1988 study was conducted after the amendment adding a $10.00 fine went into effect.

The usage rate is not a simple ratio of the number of persons observed belted to the total number of people observed. It is, instead, the ratio of estimated time on the road that front seat occupants are using safety belts to the total estimated time on the road for these occupants.

TABLE 3.07

SAFETY EQUIPMENT USE AMONG INFANTS AND CHILDREN IN THREE OBSERVATIONAL STUDIES

	August 1985		August 1987		August 1990	
	Number	Percent	Number	Percent	Number	Percent
Infants (less than 1 year of age)						
Safety Equipment Used Correctly	128	68.1	313	46.7	609	71.6
Safety Equipment Used Incorrectly	14	7.4	224	33.4	115	13.5
Safety Equipment Not Used	46	24.5	133	19.9	127	14.9
Total Infants Observed	188	100.0	670	100.0	851	100.0
Younger Children (age 1 to 3)						
Safety Equipment Used Correctly	137	31.1	870	27.1	1,571	41.7
Safety Equipment Used Incorrectly	35	7.9	537	16.7	534	14.2
Safety Equipment Not Used	269	61.0	1,801	56.1	1,665	44.2
Total Younger Children Observed	441	100.0	3,208	100.0	3,770	100.0
Older Children (age 4 to 10)						
Safety Equipment Used	204	17.2	1,819	26.0	2,264	33.0
Safety Equipment Not Used	982	82.8	5,185	74.0	4,590	67.0
Total Older Children Observed	1,186	100.0	7,004	100.0	6,854	100.0

Observations were conducted at 10 sites in 1985, and then, in an effort to increase representativeness of the sample, at 20 sites in 1987 and 1990. The definition of "older children" changed (from age 4 through 11 in 1985 to 4 through 10 in 1987 and 1990) to reflect a change in law. The apparent decrease from 1985 to 1987 in correct safety use among infants is the result of a more rigorous definition of "correct use" rather than a real decrease in correct use.

IV: MOTORCYCLE CRASHES

Motorcyclists are exposed to a greater chance of injury should a crash occur because motorcyclists are not protected by the body of a vehicle. In 1990, 86% of motorcycle crashes resulted in an injury; for total motor vehicle crashes, 31% of crashes produces an injury. Motorcycle crashes were 5 times more likely to involve a fatality. Sixty-three percent of fatal motorcycle crashes were single vehicle crashes.

Downward trend continues
Motorcycle crashes have been decreasing at all levels of severity: 1990 marks the 7th year of decline in the number of motorcycle crashes. The 1,735 crashes are 20% fewer than the average of the prior five years. Motorcyclist fatalities are 13% lower than the average of the prior five years, and injuries have decreased by 19% as well.

More drivers, fewer vehicles
The number of licensed operators has been increasing throughout the last decade. On the other hand, 1990 marks the 9th year of decline in the number of registered motorcycles.

Fatal crashes differ from non-fatal
Half of total motorcycle crashes involved collision with another vehicle. For fatal crashes, on the other hand, 48% involved collision with a fixed object. Areas of under 1,000 population accounted for only 24% of the crashes, but 46% of the fatalities.

Summer weather brings crashes
The first and last three months of the year combined, when weather is coldest, accounted for only 10% of the crashes. July had the highest number of crashes and fatalities. June, July, and August combined accounted for 56% of the crashes and injuries, and 64% of the fatalities.

Friday and Saturday most crash-involved
One-third of the motorcycle crashes occurred on Friday or Saturday. Saturday had the highest number of total crashes as well as fatal crashes. Tuesday had the fewest crashes. The hour from 4-5 PM had the highest number of total crashes; 11 PM to midnight had the highest number of fatal crashes.

Motorcyclists under 30 sustain more injuries
Two-thirds of the injuries and 70% of the fatalities to motorcyclists were sustained by those under the age of 30. The age group hardest hit were the 20-24 year-olds. A full 87% of the injuries and 88% of the fatalities were male.

Most motorcyclists killed not wearing helmets
At least 84% of the motorcyclists killed were not wearing a helmet at the time of the crash. This is also true of at least 57% of the motorcyclists who were injured.

Valid endorsements in fatal crashes decreased
The numbers of drivers with a valid motorcycle endorsement on their license has been increasing over the years. Among those involved in fatal crashes, though, it has been decreasing over the past decade. In 1990, only 53% of the drivers in fatal crashes had a valid endorsement.

Drinking drivers range from 17 through 42
Of the 43 motorcycle operators who were killed, 35 (81%) were tested for alcohol concentration. Of those tested, 71% had been drinking and 57% were over the legal limit of intoxication. Those who tested positive for alcohol ranged in age from 17 through 42.

Single vehicle crashes differ from others
Illegal/unsafe speed and physical impairment are both much more likely to be cited as contributing factors for motorcycle drivers in single vehicle crashes than they are for motorcycle drivers in multi-vehicle crashes. Only 20% of motorcycle drivers in single vehicle crashes were found to have committed no improper action; this was true of 44% of motorcycle drivers in crashes involving multiple vehicles.

Motorcyclists less likely to contribute to crash
The investigating officer found no improper driving for 44% of motorcycle drivers and only 29% of other drivers in multi-vehicle crashes. Motorcycle drivers in these crashes were most often cited for: driver inattention/distraction, illegal/unsafe speed, and failure to yield the right of way. Other drivers in these crashes are most often cited for: failure to yield the right of way, driver inattention/distraction, and improper/unsafe lane use.

TABLE 4.01

MOTORCYCLE CRASH SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Record High (since 1970)
Total Crashes	**3,063**	**2,518**	**2,811**	**2,768**	**2,748**	**2,318**	**2,121**	**1,969**	**1,748**	**1,735**	**3,308 (1980)**
Fatal Crashes	92	72	70	59	75	63	51	57	37	46	112 (1980)
Personal Injury Crashes	2,516	2,115	2,377	2,302	2,238	1,891	1,692	1,628	1,463	1,446	2,728 (1980)
Property Damage Crashes	455	331	364	407	435	364	378	284	248	243	537 (1976)
Persons Killed:											
Motorcyclists	96	70	73	62	77	66	51	58	37	50	121 (1980)
Non-Motorcyclists/Unknown	0	6	0	1	1	0	3	4	0	2	9 (1975)
Persons Injured:											
Motorcyclists*	2,874	2,381	2,678	2,590	2,500	2,152	1,853	1,817	1,617	1,605	3,359 (1980)
Non-Motorcyclists/Unknown	196	189	191	207	204	142	145	126	104	126	N/A
Licensed Operators	238,926	246,134	252,808	256,836	272,317	282,087	288,424	293,347	290,000	292,074	293,347 (1988)
Registered Motorcycles	166,151	159,345	155,502	153,851	151,449	141,261	134,590	128,956	123,308	120,081	166,151 (1981)
Rates:											
Fatal Motorcycle Crashes Per 100 Motorcycle Crashes	3.0	2.9	2.5	2.2	2.7	2.7	2.4	2.9	2.1	2.7	3.6 (1978)
Fatal Crashes Per 100 Crashes (All Vehicles)	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8 (1970)
Motorcyclist Fatalities Per 10,000 Motorcycle Registrations	5.8	4.5	4.7	4.0	5.1	4.7	3.8	4.5	3.0	4.2	7.7 (1980)
Motorcyclist Injuries Per 10,000 Motorcycle Registrations	173.0	149.4	172.2	165.5	165.1	152.3	137.7	140.9	131.1	133.7	212.8 (1980)
Total Motorcycle Crashes Per 10,000 Motorcycle Registrations	184.4	158.0	180.8	179.9	181.4	164.1	157.6	152.7	141.8	144.5	209.6 (1980)

* 1983 and 1984 injury figures include some all-terrain vehicles. Fatality figures do not.

TABLE 4.02

1990 MOTORCYCLE CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Motorcyclists Killed	Motorcyclists Injured
Collision With:						
Other Motor Vehicle	16	697	150	863	18	764
Parked Motor Vehicle	0	16	33	49	0	16
Bicycle	0	12	0	12	0	8
Pedestrian	0	10	0	10	0	8
Animal	1	62	10	73	1	75
Fixed Object	22	181	7	210	24	208
Other Object	0	27	1	28	0	30
Non-Collision:						
Overturn	4	328	32	364	4	372
Other/Unknown	3	113	10	126	3	124
Total	46	1,446	243	1,735	50	1,605

TABLE 4.03

1990 MOTORCYCLE CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Motorcyclists Killed	Motorcyclists Injured
100,000 and Over	6	276	59	341	6	301
50,000 - 99,999	3	85	9	97	3	90
25,000 - 49,999	7	260	54	321	7	286
10,000 - 24,999	7	218	40	265	8	232
5,000 - 9,999	0	107	23	130	0	118
2,500 - 4,999	0	41	6	47	0	43
1,000 - 2,499	2	24	5	31	2	27
Under 1,000	20	368	32	420	23	432
Unknown	1	67	15	83	1	76
Total	46	1,446	243	1,735	50	1,605

TABLE 4.04

1990 MOTORCYCLE CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Motorcyclists Killed	Motorcyclists Injured
January	0	1	0	1	0	1
February	0	4	0	4	0	4
March	0	28	7	35	0	29
April	0	115	22	137	0	122
May	6	193	35	234	6	215
June	7	274	41	322	8	314
July	12	271	45	328	13	302
August	10	257	47	314	11	282
September	9	189	26	224	10	208
October	1	83	13	97	1	97
November	1	29	7	37	1	29
December	0	2	0	2	0	2
Total	46	1,446	243	1,735	50	1,605

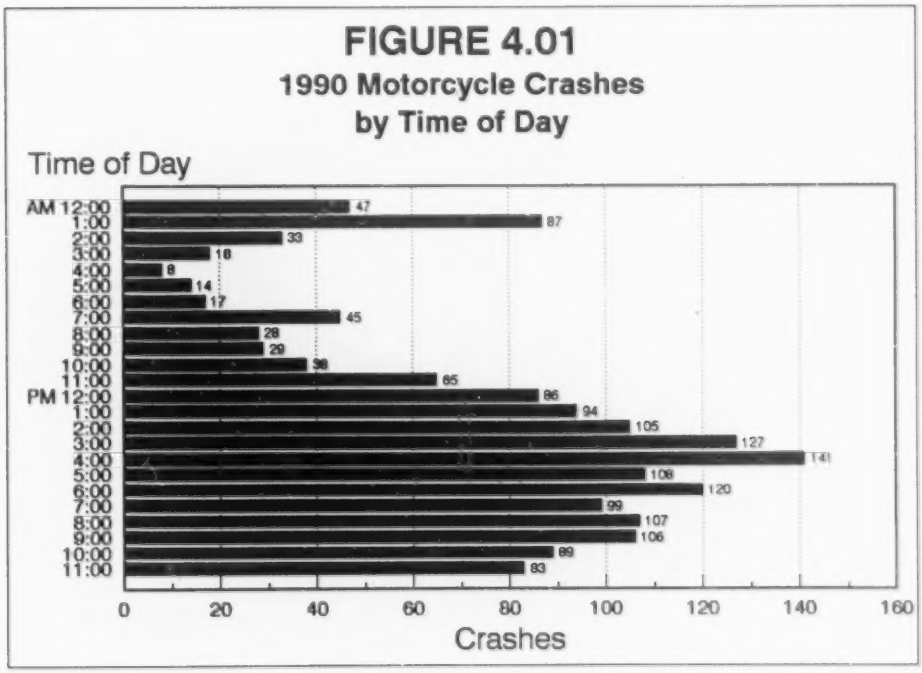


TABLE 4.05

1990 MOTORCYCLE CRASHES BY TIME AND DAY

Hour Beginning	Total Crashes	Fatal Crashes	Sunday All	Sunday Fatal	Monday All	Monday Fatal	Tuesday All	Tuesday Fatal	Wednesday All	Wednesday Fatal	Thursday All	Thursday Fatal	Friday All	Friday Fatal	Saturday All	Saturday Fatal
Midnight	47	2	7	0	9	0	3	0	6	0	7	1	3	0	12	1
1:00	87	4	16	0	9	0	9	1	9	0	12	0	8	1	24	2
2:00	33	3	9	1	3	0	1	0	3	0	3	0	3	1	11	1
3:00	18	1	3	0	4	1	1	0	2	0	0	0	4	0	4	0
4:00	8	1	3	0	0	0	1	1	1	0	0	0	1	0	2	0
5:00	14	1	3	0	1	0	1	0	3	0	2	0	2	0	2	1
6:00	17	1	1	0	2	0	3	0	5	0	4	1	1	0	1	0
7:00	45	0	1	0	7	0	11	0	7	0	10	0	7	0	2	0
8:00	28	2	2	0	1	0	9	0	5	1	6	1	1	0	4	0
9:00	29	1	2	0	5	0	7	1	3	0	1	0	6	0	5	0
10:00	38	0	6	0	3	0	4	0	9	0	4	0	4	0	8	0
11:00	65	1	8	0	10	0	9	0	9	0	1	0	11	0	17	1
Noon	86	0	11	0	11	0	8	0	10	0	15	0	14	0	17	0
1:00	94	1	11	0	13	1	5	0	15	0	11	0	18	0	21	0
2:00	105	1	15	0	17	1	16	0	9	0	19	0	10	0	19	0
3:00	127	3	12	0	17	1	12	0	18	1	29	1	26	0	13	0
4:00	141	1	22	0	22	1	22	0	20	0	16	0	24	0	15	0
5:00	108	3	14	1	15	1	12	0	14	0	14	0	23	0	16	1
6:00	120	3	17	1	9	0	17	0	18	0	17	1	19	1	23	0
7:00	99	3	16	1	12	1	13	0	16	0	12	1	12	0	18	0
8:00	107	3	14	0	16	1	12	1	16	0	12	0	20	0	17	1
9:00	106	4	9	0	12	1	10	0	14	0	19	0	21	2	21	1
10:00	89	0	11	0	16	0	11	0	12	0	11	0	13	0	15	0
11:00	83	6	13	0	6	0	10	3	6	0	11	1	23	1	14	1
Not Stated	41	1	5	0	5	0	4	0	4	0	4	0	14	1	5	0
Total	1,735	46	231	4	225	9	211	7	234	2	240	7	288	7	306	10

TABLE 4.06

MOTORCYCLISTS KILLED OR INJURED BY AGE AND SEX, 1990

	Killed			Injured											
				Severe			Moderate			Minor			Total		
Age Group	M	F	Total	M	F	Total*	M	F	Total*	M	F	Total*	M	F	Total*
0 - 4	0	0	0	2	0	2	0	0	0	0	1	1	2	1	3
5 - 9	0	0	0	0	0	0	1	2	3	0	1	1	1	3	4
10 - 14	0	0	0	6	0	6	3	2	5	2	0	2	11	2	13
15 - 19	10	2	12	71	15	86	110	18	128	70	14	84	251	47	298
20 - 24	13	1	14	97	17	114	186	22	208	107	16	123	390	55	445
25 - 29	8	1	9	77	8	85	113	14	127	63	14	77	253	36	289
30 - 34	6	0	6	51	5	56	87	6	93	42	6	48	180	17	197
35 - 39	3	1	4	33	2	35	42	7	49	23	8	31	98	17	115
40 - 44	3	0	3	22	4	26	35	2	37	22	2	24	79	8	87
45 - 49	1	0	1	10	2	12	15	4	19	11	0	11	36	6	42
50 - 54	0	0	0	7	0	7	10	1	11	5	1	6	22	2	24
55 - 59	0	0	0	6	0	6	6	0	6	3	0	3	15	0	15
60 - 64	0	0	0	3	0	3	3	0	3	0	0	0	6	0	6
65 - 69	0	0	0	1	0	1	3	0	3	2	0	2	6	0	6
70 & Older	0	1	1	0	0	0	1	0	1	0	0	0	1	0	1
Not Stated	0	0	0	4	3	7	9	5	14	30	5	39	43	13	60
Total	44	6	50	390	56	446	624	83	707	380	68	452	1,394	207	1,605

* Where columns do not add across to total, sex was not reported on the accident report form.

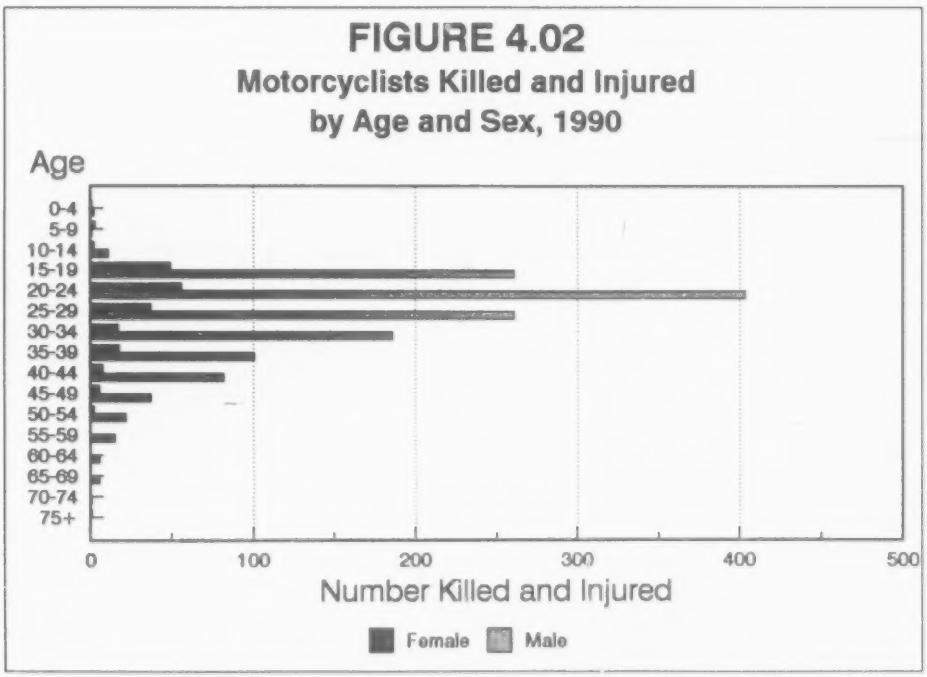


TABLE 4.07

HELMET USE BY MOTORCYCLISTS KILLED OR INJURED, 1986 - 1990

	Helmet Used		Helmet Not Used		Helmet Use Unknown		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Killed								
1986	18	27.3%	42	63.6%	6	9.1%	66	100.0%
1987	16	31.4	33	64.7	2	3.9	51	100.0
1988	12	20.7	41	70.7	5	8.6	58	100.0
1989	4	10.8	29	78.4	4	10.8	37	100.0
1990	2	4.0	42	84.0	6	12.0	50	100.0
Injured								
1986	720	33.5	1,096	50.9	336	15.6	2,152	100.0%
1987	*		*		*		1,853	100.0
1988	506	27.8	1,007	55.4	304	16.7	1,817	100.0
1989	447	27.6	886	54.8	284	17.6	1,617	100.0
1990	419	26.1	917	57.1	269	16.8	1,605	100.0

*Data for these categories are unavailable for 1987.

TABLE 4.08

ENDORSEMENT STATUS OF MOTORCYCLE OPERATORS INVOLVED IN FATAL CRASHES, 1981 - 1990

Year	Valid Endorsement*		Permit Only		Cancelled, Suspended, Revoked		No Endorsement		Total** For Year	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1981	73	80.2%	2	2.2%	4	4.4%	12	13.2%	91	100.0%
1982	53	76.8	2	2.9	2	2.9	12	17.4	69	100.0
1983	47	68.1	6	8.7	3	4.3	13	18.8	69	100.0
1984	50	73.5	1	1.5	3	4.4	14	20.6	68	100.0
1985	50	64.9	5	6.5	7	9.1	15	19.5	77	100.0
1986	41	64.1	1	1.6	7	10.9	15	23.4	64	100.0
1987	33	64.7	1	2.0	10	19.6	7	13.7	51	100.0
1988	32	55.2	3	5.2	9	15.5	13	22.4	58	100.0
1989	22	56.4	0	0.0	8	20.5	9	23.1	39	100.0
1990	25	53.2	2	4.3	9	19.1	11	23.4	47	100.0

* A valid endorsement means that the driver's license has been "endorsed" to permit operation of a motorcycle.
** Rows may not add to total due to the unknown status of some motorcycle operators.

TABLE 4.09

ALCOHOL USE BY MOTORCYCLE DRIVERS, 1981 - 1990

Year	Killed	Tested	Drinking* (.01 or more) Number	Drinking* (.01 or more) Percent	Drunk* (.10 or more) Number	Drunk* (.10 or more) Percent
1981	76	44	30	68%	25	57%
1982	55	39	23	59	17	44
1983	56	36	24	67	20	56
1984	57	45	32	71	23	51
1985	63	51	33	65	25	49
1986	56	46	30	65	25	54
1987	45	42	25	60	22	52
1988	52	45	25	56	17	38
1989	31	30	21	70	18	60
1990	43	35	25	71	20	57

*Percentages are based on those motorcycle drivers tested.

TABLE 4.10

1990 MOTORCYCLE DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY AGE

Age	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)	Blood Alcohol Concentration .01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	4	4	2	1	1	0	0	1	0	0
18	0	0	0	0	0	0	0	0	0	0
19	3	3	1	1	0	0	1	0	0	0
20	4	3	3	2	0	1	1	0	0	1
14 & Younger	0	0	0	0	0	0	0	0	0	0
15 - 19	7	7	3 (43%)	2 (29%)	1	0	1	1	0	0
20 - 24	14	11	8 (73%)	5 (45%)	0	3	1	3	0	1
25 - 29	8	6	5 (83%)	4 (67%)	1	0	1	1	2	0
30 - 34	6	5	4 (80%)	4 (80%)	0	0	0	2	2	0
35 - 39	3	2	2 (100%)	2 (100%)	0	0	0	2	0	0
40 - 44	3	3	3 (100%)	3 (100%)	0	0	0	0	3	0
45 - 49	1	0	0	0	0	0	0	0	0	0
50 - 54	0	0	0	0	0	0	0	0	0	0
55 - 59	0	0	0	0	0	0	0	0	0	0
60 & Older	1	1	0 (0%)	0 (0%)	0	0	0	0	0	0
Total	43	35	25 (71%)	20 (57%)	2	3	3	9	7	1

* Percentages are based on those motorcycle drivers tested.

TABLE 4.11

CONTRIBUTING FACTORS IN 1990 MOTORCYCLE CRASHES

	Single Vehicle Crashes		*Multi-Vehicle Crashes*			
	Attributed to Motorcycle Drivers		Attributed to Motorcycle Drivers		Attributed to Other Drivers	
Contributing Factors	Number	Percent	Number	Percent	Number	Percent
Human Factors:						
Illegal/Unsafe Speed	292	33.3%	128	18.2%	31	3.4%
Driver Inattention/Distraction	145	16.6	174	24.7	224	24.6
Driver Inexperience	118	13.5	49	7.0	19	2.1
Physical Impairment	131	15.0	34	4.8	27	3.0
Improper/Unsafe Lane Use	22	2.5	31	4.4	58	6.4
Following Too Closely	6	0.7	51	7.2	48	5.3
Failure to Yield Right of Way	4	0.5	66	9.4	308	33.8
Improper Passing/Overtaking	8	0.9	56	8.0	8	0.9
Disregard for Traffic Control Device	10	1.1	18	2.6	28	3.1
Driving Left of Roadway Center--Not Passing	8	0.9	15	2.1	12	1.3
Vision Obscured	7	0.8	13	1.8	24	2.6
Improper Turn	9	1.0	10	1.4	53	5.8
Improper Parking/Starting/ Stopping	5	0.6	4	0.6	14	1.5
Unsafe Backing	0	0.0	0	0.0	8	0.9
Impeding Traffic	2	0.2	3	0.4	5	0.5
Improper or No Signal	0	0.0	2	0.3	5	0.5
Pedestrian Violation or Error	0	0.0	0	0.0	7	0.8
Other Human Factor	26	3.0	19	2.7	13	1.4
Vehicular Factors:						
Skidding	29	3.3	9	1.3	4	0.4
Defective Equipment	16	1.8	9	1.3	4	0.4
Other Vehicle Factor	19	2.2	4	0.6	7	0.8
Miscellaneous Factors:						
Road Defects	11	1.3	4	0.6	1	0.1
Weather	8	0.9	5	0.7	4	0.4
Total	876	100.0%	704	100.0%	912	100.0%
No Improper Driving	146		468		308	
Total Number Drivers	731		1,054		1,046	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. Bicyclists and pedestrians are included as other drivers in this table.

V: TRUCK CRASHES

This section summarizes data on crashes involving trucks. A "truck crash" is defined as an accident in which the investigating officer indicates that at least one of the vehicles was a truck or truck tractor, truck with semi-trailer, truck with twin-trailers, or truck with other trailer. Pickups trucks and vans are *not* included.

Truck crashes decrease more than non-truck crashes

In 1990, there were 6,712 crashes involving trucks; 83 people died and 2,390 were injured in those crashes. These numbers represent 4%, 7%, and 1% reductions, respectively, from their prior five-year averages. They are bigger reductions than non-truck crashes experienced.

Killed and injured are not in trucks

By definition, every truck crash involved at least one truck. Truck occupants, though, were usually uninjured in crashes. Only 7 of the 83 fatalities occurred among truck occupants; most (57) of the remainder occurred among automobile occupants. Among the 2,390 injured, 27% were truck occupants and 55% were automobile occupants. The remaining killed and injured people were distributed among a variety of vehicle types or were bicyclists or pedestrians.

Contributing factors are similar among truck and non-truck drivers

For each driver in a crash, police may report zero, one, or two factors that they believe contributed to the crash. Truck crashes were similar to all crashes, and truck drivers were similar to all drivers, in the types of factors cited. Driver inattention or distraction was cited much more frequently than any other single factor (27% of the time for truck drivers and 25% for non-truck drivers). Illegal or unsafe speed and failure to yield right of way were the two factors cited next most frequently. Only 1% of the truck drivers and 3% of the other vehicle drivers were suspected to have been drinking or to have been under the influence of alcohol at the time of the crash.

Straight trucks most often involved

Straight trucks and truck tractors not pulling trailers accounted for 59% of all the trucks in crashes. Truck pulling semi-trailers accounted for another 35%. Trucks pulling twin or other trailers accounted for only 5%. Almost three-fourths of the drivers of these trucks were between 20 and 50 years of age, so there were fewer teenage drivers and fewer older drivers among the truck drivers than was true of the population of drivers in all crashes.

Two-vehicle collisions predominate

Almost three-fourths (74%) of truck crashes involved a collision with one or more other vehicles. This is higher than crashes generally, for which 63% involved collision with other vehicles.

Dry roads and clear weather conditions typify truck and non-truck crashes equally

Truck crashes are similar to other crashes in that they predominantly occur during good driving conditions. Sixty-nine percent of the truck crashes occurred on dry road surfaces (compared with 67% for all crashes), and 58% occurred on clear weather days (compared with 57% for all crashes).

Truck crashes are workday-related

Eighty-seven percent of the truck crashes occurred during the work week, Monday through Friday (compared to 73% of all crashes), and 77% occurred between the hours of 6:00 AM and 6:00 PM (compared to 63% of all crashes). Truck crashes were similar to all crashes, though, in having an approximately equal distribution across months of the year.

Truck crashes occur on big highways more than non-truck crashes

Truck crashes differed some from all crashes in that a higher proportion of them occurred on the big highways. In 1990, 53% of the truck crashes occurred on interstates or on trunk highways, compared to 31% of all crashes. Truck crashes are like other crashes, though, in that the more serious ones are more likely to occur in more sparsely populated areas.

TABLE 5.01

TRUCK CRASH SUMMARY, 1985 - 1990

	1985	1986	1987	1988	1989	1990
Total Crashes	7,973	6,908	5,668	7,038	7,381	6,712
Fatal Crashes	86	85	65	70	77	70
Persons Killed	101	100	71	78	94	83
Injury Crashes	1,941	1,674	1,443	1,729	1,784	1,652
Persons Injured	2,832	2,371	2,033	2,444	2,411	2,390
Property Damage Crashes	6,424	5,149	4,160	5,239	5,520	4,990

TABLE 5.02

PERSONS KILLED OR INJURED IN 1990 TRUCK CRASHES BY VEHICLE OCCUPIED

		Injured			
Vehicle Type	Killed	Severe	Moderate	Minor	Total
Automobile	57	157	478	672	1,307
Truck or Truck Tractor	3	40	147	232	419
Truck with Semi-Trailer	4	19	74	101	194
Truck with Twin Trailer	0	0	2	2	4
Truck with Other Trailer	0	3	13	24	40
Pickup Truck	8	25	63	104	192
Van	4	13	24	37	74
Motorcycle	1	9	6	5	20
All Terrain Vehicle	0	0	0	0	0
Moped	0	2	0	1	3
School Bus	1	3	37	11	51
Other Bus	0	1	6	5	12
Motorhome Camper	0	0	1	4	5
Snowmobile	0	0	0	0	0
Farm Equipment	0	0	4	1	5
Taxicab	0	0	2	1	3
Hit and Run Vehicle	0	1	3	1	5
Police Vehicle	0	0	0	3	3
Road Maintenance Vehicle	0	0	1	2	3
Other Public Owned Vehicle	0	0	0	2	2
Other Privately Owned Vehicle	0	0	0	1	1
Bicycle	0	4	5	4	13
Pedestrian	5	8	10	16	34
Total	83	285	876	1,229	2,390

TABLE 5.03

CONTRIBUTING FACTORS IN 1990 TRUCK CRASHES

Contributing Factors	Attributed to Truck Drivers Number	Attributed to Truck Drivers Percent	Attributed to Other Drivers Number	Attributed to Other Drivers Percent
Human Factors				
Driver Inattention/Distraction	1,199	26.7%	895	25.2%
Illegal/Unsafe Speed	403	9.0	408	11.5
Failure to Yield Right of Way	400	8.9	441	12.4
Improper Lane Use	339	7.5	286	8.1
Following Too Closely	286	6.4	229	6.4
Improper Turn	211	4.7	83	2.3
Unsafe Backing	201	4.5	47	1.3
Vision Obscured	182	4.0	94	2.6
Disregard for Traffic Control Device	108	2.4	125	3.5
Improper Passing	107	2.4	171	4.8
Driver Inexperience	103	2.3	118	3.3
Physical Impairment	89	2.0	109	3.1
Improper Parking	78	1.7	55	1.5
Improper or No Signal	28	0.6	23	0.6
Driving Left of Center (Not Passing)	39	0.9	78	2.2
Impeding Traffic	26	0.6	22	0.6
Pedestrian Violation	0	0.0	11	0.3
Other Human Factors	57	1.3	43	1.2
Vehicular Factors				
Defective Brakes	109	2.4	14	0.4
Skidding	78	1.7	76	2.1
Oversize or Overweight Vehicle	38	0.8	2	0.1
Defective Tire	25	0.6	4	0.1
Defective Lights	34	0.8	12	0.3
Other Vehicular Factor	139	3.1	27	0.8
Miscellaneous Factors				
Weather	203	4.5	175	4.9
Road Defect	12	0.3	4	0.1
Total	4,494	100.0%	3,552	100.0%
No Improper Driving	2,116		1,983	
Total Number of Drivers	7,007		6,002	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. Bicyclists and pedestrians are included as other drivers in this table.

TABLE 5.04

AGE OF TRUCK DRIVERS IN 1990 CRASHES

Driver Age	Truck or Truck Tractor	Truck with Semi-Trailer	Truck with Twin Trailer	Truck with Other Trailer	Total
15 - 19	218	21	0	19	258
20 - 24	580	212	2	35	829
25 - 29	743	386	3	48	1,180
30 - 34	609	391	6	62	1,068
35 - 39	396	333	6	44	779
40 - 44	332	319	6	28	685
45 - 49	251	250	10	28	539
50 - 54	179	200	8	18	405
55 - 59	133	148	4	9	294
60 - 64	114	69	3	6	192
65 & Older	106	29	1	14	150
Not Stated	491	119	0	18	628
Total	4,152	2,477	49	329	7,007

TABLE 5.05

DRIVERS IN 1990 TRUCK CRASHES BY PHYSICAL CONDITION*

Physical Condition	Truck Driver	Other Driver
Normal	4,893	3,942
Under the Influence	45	95
Had Been Drinking	46	58
Had Been Using Drugs	1	1
Asleep	37	14
Fatigued	19	15
Ill	1	3
Other	7	25
Unknown	1,958	1,849
Total	7,007	6,002

* As noted by police officer on accident report.

TABLE 5.06

1990 TRUCK CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	Property Damage Crashes	Total Crashes
Collision With:						
Other Motor Vehicle	61	176	454	661	3,595	4,947
Parked Motor Vehicle	1	11	25	23	383	443
Railroad Train	1	1	2	0	11	15
Bicycle	0	4	2	4	0	10
Pedestrian	5	7	8	11	0	31
Animal	0	1	0	3	152	156
Fixed Object	0	7	47	33	436	523
Other Object	0	2	4	3	87	96
Non-Collision:						
Overturn	1	12	64	56	182	315
Fire or Explosion	0	0	0	0	7	7
Submersion	0	0	0	0	0	0
Other	1	4	11	16	137	169
Total	70	225	617	810	4,990	6,712

TABLE 5.07

1990 TRUCK CRASHES BY ROAD SURFACE CONDITION

Road Surface Condition	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	Property Damage Crashes	Total Crashes
Dry	50	168	427	569	3,422	4,636
Wet	8	30	83	100	614	835
Snow or Slush	4	9	34	44	223	314
Ice or Snow Packed	8	16	68	80	580	752
Other	0	2	3	8	36	49
Unknown	0	0	2	9	115	126
Total	70	225	617	810	4,990	6,712

TABLE 5.08

1990 TRUCK CRASHES BY TIME AND DAY

Time of Day	Total	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight - 2:59 AM	182	28	16	16	18	36	26	42
3:00 - 5:59 AM	143	17	14	15	22	17	25	33
6:00 - 8:59 AM	961	15	179	171	177	180	167	72
9:00 - 11:59 AM	1,359	38	246	219	217	237	251	151
Noon - 2:59 PM	1,472	45	269	228	240	258	319	113
3:00 - 5:59 PM	1,400	59	236	246	229	280	270	80
6:00 - 8:59 PM	553	46	82	87	82	89	128	39
9:00 - 11:59 PM	374	33	49	49	50	63	86	44
Unknown	268	15	36	38	48	52	54	25
Total	6,712	296	1,127	1,069	1,083	1,212	1,326	599

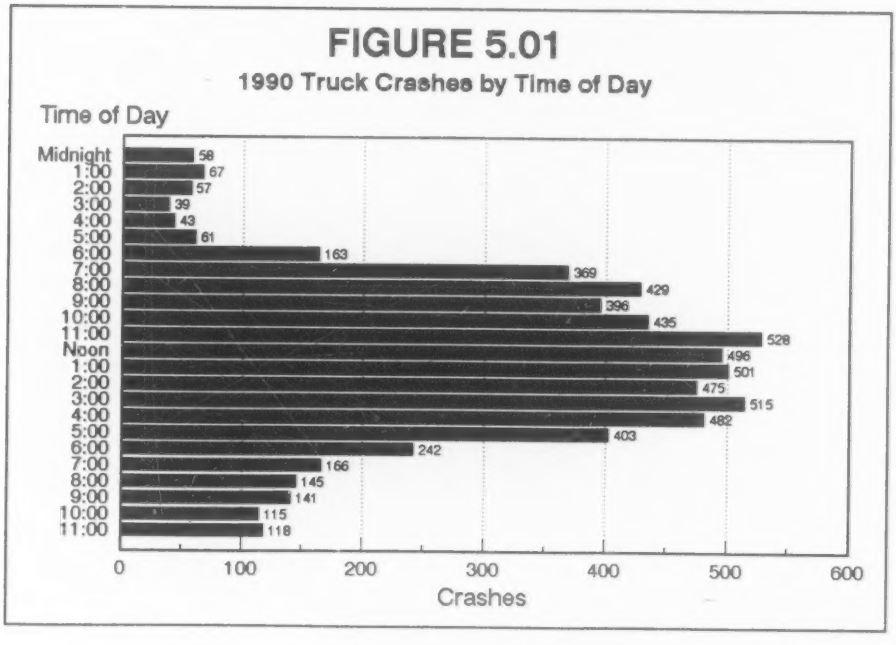


TABLE 5.09

1990 TRUCK CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	4	107	332	443	4	162
February	11	108	387	506	15	144
March	2	105	333	440	2	142
April	2	106	271	379	2	141
May	8	140	457	605	9	200
June	4	134	446	584	6	202
July	3	164	422	589	4	232
August	10	167	456	633	11	240
September	5	161	394	560	6	268
October	4	167	473	644	4	244
November	11	124	461	596	11	184
December	6	169	558	733	9	231
Total	70	1,652	4,990	6,712	83	2,390

TABLE 5.10

1990 TRUCK CRASHES BY WEATHER CONDITION

Weather Condition	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	Property Damage Crashes	Total Crashes
Clear	36	127	344	472	2,895	3,874
Cloudy	21	60	150	189	1,082	1,502
Rain	3	20	47	61	346	477
Snow	5	10	36	46	319	416
Sleet/Hail/Freezing Rain	2	6	16	23	118	165
Fog/Smog/Smoke	0	2	12	8	51	73
Blowing Sand/Dust/Snow	3	0	7	3	26	39
Severe Cross Winds	0	0	3	3	16	22
Other	0	0	0	0	12	12
Unknown	0	0	2	5	125	132
Total	70	225	617	810	4,990	6,712

TABLE 5.11

1990 TRUCK CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	Property Damage Crashes	Total Crashes
100,000 & Over	2	36	93	179	1,101	1,411
50,000 - 99,999	2	7	29	54	311	403
25,000 - 49,999	1	28	92	126	783	1,030
10,000 - 24,999	11	20	84	102	726	943
5,000 - 9,999	6	19	36	57	377	495
2,500 - 4,999	1	10	17	35	218	281
1,000 - 2,499	3	5	10	19	126	163
Under 1,000	44	94	229	211	1,053	1,631
Unknown	0	6	27	27	295	355
Total	70	225	617	810	4,990	6,712

TABLE 5.12

1990 TRUCK CRASHES BY TYPE OF ROADWAY

Roadway Type	Fatal Crashes	Severe Injury Crashes	Moderate Injury Crashes	Minor Injury Crashes	Property Damage Crashes	Total Crashes
Interstate Highway	15	19	84	136	709	963
US Trunk Highway	22	46	135	147	753	1,103
State Trunk Highway	19	56	124	202	1,061	1,462
County State-Aid Highway	12	64	134	176	1,017	1,403
Municipal State-Aid Street	0	22	64	79	691	856
County Road	1	5	17	17	67	107
Township Road	0	4	15	14	67	100
Municipal Street	1	8	41	35	561	646
Other Road	0	1	3	4	64	72
Total	70	225	617	810	4,990	6,712

VI: PEDESTRIAN CRASHES

Crashes reported in this section deal with motor vehicle crashes that injure or kill pedestrians. Prior to 1984, a crash was defined as a pedestrian crash only if the pedestrian was the first "object" struck by a motor vehicle. Beginning in 1984, any crash where a pedestrian is struck and injured is defined as a pedestrian crash.

Crashes, injuries continue downward trend
There were 1,512 crashes in 1990 where a pedestrian was injured. This is a 7.5% decrease from the average of the prior five years. The number of injuries in these crashes was down 7.3%, to 1,499. There were 65 pedestrians killed; this is 2 fewer than in 1989.

Pedestrians killed concentrated among young
In the ten years from 1981 - 1990, the age group from 15-19 years of age experienced the highest number of fatalities. The age group with the second highest number of fatalities was 5-9 year-olds. Fatalities drop off after age 30 and increase again after age 75.

5 - 9 year-olds most injured age group
The 5-9 year old age group had the highest number of injuries in 1990. The injuries were split almost evenly between males and females. The 30-34 year old age group had the highest number of fatalities. Those under age 30 made up 56% of the injuries.

November highest month
November had the highest number of crashes, fatalities, and injuries. March had the lowest number.

Afternoon most crash-involved
The afternoon and early evening hours from 2-7 PM accounted for 41% of the crashes. The hour from 5 - 6 PM was the single hour with the most crashes. The hour from 10 - 11 PM was the hour with the highest number of fatal crashes. Friday had the most crashes, Sunday the least.

Rural areas overrepresented in fatalities
The areas of under 1,000 population accounted for 23% of the fatalities but only 5% of the total crashes. Areas of over 100,000, on the other hand, accounted for about half of the total crashes and injuries.

Vehicles going straight prior to crash
In two-thirds of the crashes, fatalities, and injuries, the striking vehicle was going straight prior to the crash. The second most common pre-crash maneuver involved a vehicle making a left turn prior to striking the pedestrian.

Pedestrians killed outside crosswalk
Of the pedestrians killed, 34% were crossing the road with no crosswalk and no signal. This was true of 27% of the injured pedestrians. The pedestrian action that was next most likely to be fatal was walking in the road with traffic. For injured pedestrians, the second most common action was crossing with the signal.

Fewer contributing factors cited for drivers
Officers investigating pedestrian crashes cited no improper actions for 40% of the drivers but only 21% of the pedestrians. Pedestrians were most likely to be cited for some type of pedestrian violation followed by physical impairment. Drivers were most likely to be cited for driver inattention/distraction, followed by failure to yield right of way and obscured vision.

Alcohol positive pedestrians over legal limit
Of the 65 pedestrians who were killed, 41 (63%) were tested for alcohol concentration. Of these, 16 (39%) tested positive for alcohol: all but one of these were legally drunk.

Older pedestrians non-drinking
Most of the fatally injured pedestrians who had been drinking were under the age of 40. Among those tested, no one over the age of 65 had been drinking. The time period from 9 PM - 3 AM accounted for 80% of the pedestrians who tested positive for alcohol.

TABLE 6.01

PEDESTRIAN CRASH SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Pedestrian Crashes*	1,648	1,374	1,516	1,690	1,845	1,610	1,556	1,575	1,591	1,512
Pedestrians Killed	100	76	62	55	65	71	62	69	67	65
Pedestrians Injured	1,658	1,438	1,625	1,682	1,837	1,570	1,533	1,566	1,578	1,499

*Prior to 1984 a crash was defined as a pedestrian crash only if a pedestrian was the first "object" struck by a motor vehicle. Beginning in 1984, any crash where a pedestrian is struck and injured is defined as a pedestrian crash.

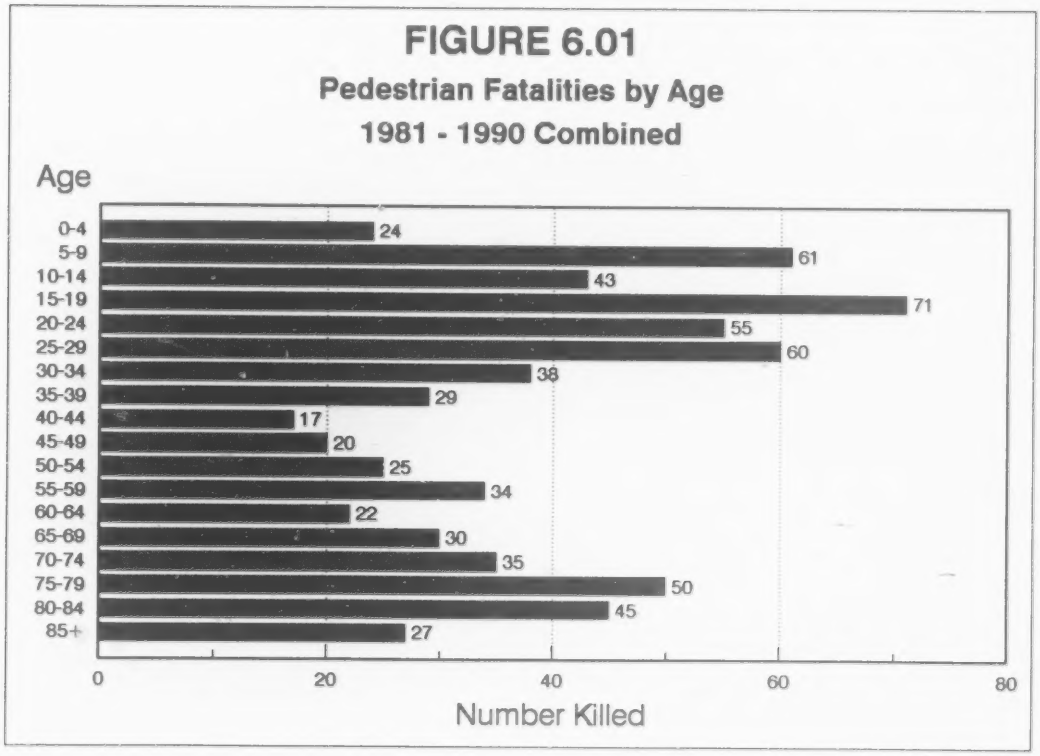


TABLE 6.02

PEDESTRIANS KILLED OR INJURED BY AGE AND SEX, 1990

Age Group	Killed			Injured											
				Severe			Moderate			Minor			Total		
	M	F	Total	M	F	Total*	M	F	Total*	M	F	Total*	M	F	Total*
0 - 4	1	0	1	13	7	20	18	7	25	18	15	33	49	29	78
5 - 9	4	0	4	32	20	52	44	26	70	51	33	84	127	79	206
10 - 14	0	3	3	18	12	30	30	27	57	47	34	81	95	73	168
15 - 19	4	1	5	15	12	27	37	36	73	21	27	48	73	75	148
20 - 24	5	0	5	14	19	34	26	19	45	24	28	52	64	66	131
25 - 29	4	1	5	13	8	21	21	12	33	32	21	53	66	41	107
30 - 34	5	3	8	13	8	21	31	19	50	24	19	44	68	46	115
35 - 39	4	1	5	11	10	21	10	9	19	26	11	37	47	30	77
40 - 44	1	1	2	10	4	14	11	7	18	15	10	25	36	21	57
45 - 49	0	0	0	6	9	15	9	3	12	14	5	19	29	17	46
50 - 54	1	1	2	7	9	16	6	5	11	8	4	12	21	18	39
55 - 59	1	1	2	7	3	10	7	8	15	3	7	10	17	18	35
60 - 64	1	2	3	1	7	8	4	4	8	10	7	17	15	18	33
65 - 69	4	2	6	8	4	12	3	11	14	3	6	9	14	21	35
70 - 74	1	2	3	5	10	15	2	3	5	7	2	9	14	15	29
75 - 79	3	3	6	3	10	13	4	4	8	3	7	10	10	21	31
80 - 84	1	2	3	5	6	11	0	5	6	4	5	9	9	16	26
85 & Older	0	2	2	2	6	8	2	4	6	5	2	7	9	12	21
Not Stated	0	0	0	1	2	3	6	6	13	44	41	101	51	49	117
Total	40	25	65	184	166	351	271	215	488	359	284	660	814	665	1,499

* Where columns do not add across, sex was not stated on accident report.

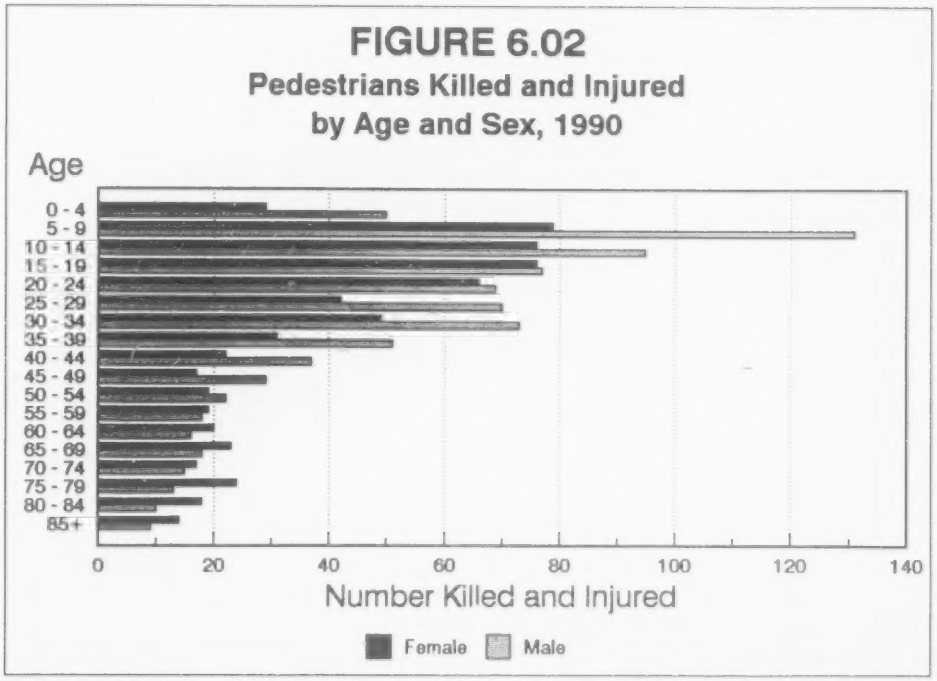


TABLE 6.03

1990 PEDESTRIAN CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Total Crashes	Pedestrians Killed	Pedestrians Injured
January	5	120	125	5	124
February	3	112	115	3	116
March	1	96	97	1	101
April	8	127	135	8	132
May	3	121	124	3	122
June	1	118	119	1	118
July	8	117	125	8	120
August	7	108	115	7	117
September	8	135	143	8	138
October	5	128	133	5	135
November	10	141	151	10	146
December	6	124	130	6	130
Total	65	1,447	1,512	65	1,499

FIGURE 6.03

1990 Pedestrian Crashes by Time of Day

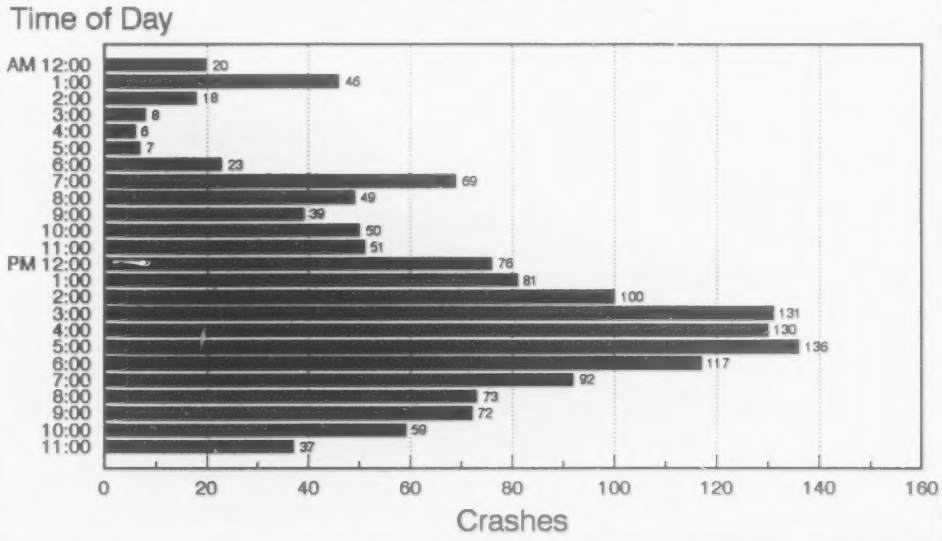


TABLE 6.04

1990 PEDESTRIAN CRASHES BY TIME AND DAY

Hour Beginning	Fatal Crashes	Total Crashes	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight	2	20	5	0	1	0	1	2	11
1:00 AM	2	46	15	6	3	3	0	3	16
2:00 AM	4	18	2	3	0	0	4	1	8
3:00 AM	0	8	2	2	1	1	0	0	2
4:00 AM	0	6	2	0	0	2	0	0	2
5:00 AM	2	7	1	1	2	0	0	2	1
6:00 AM	4	23	1	2	6	1	6	5	2
7:00 AM	2	69	1	9	18	7	16	15	3
8:00 AM	2	49	1	11	14	9	6	5	3
9:00 AM	2	39	2	8	7	7	9	5	1
10:00 AM	4	50	6	10	3	7	7	8	9
11:00 AM	5	51	5	10	13	5	5	8	5
Noon	2	76	5	10	11	9	6	18	17
1:00 PM	2	81	7	7	12	15	12	14	14
2:00 PM	3	100	4	20	14	11	16	13	22
3:00 PM	0	131	14	22	17	16	32	19	11
4:00 PM	4	130	5	26	29	21	19	17	13
5:00 PM	2	136	5	17	34	26	20	20	14
6:00 PM	6	117	8	21	11	21	23	23	10
7:00 PM	3	92	5	14	7	20	15	15	16
8:00 PM	1	73	10	9	13	8	9	14	10
9:00 PM	4	72	6	5	12	5	11	15	18
10:00 PM	7	59	5	5	5	9	6	21	8
11:00 PM	2	37	6	1	2	4	6	13	5
Unknown	0	22	2	3	6	4	4	0	3
Total	65	1,512	125	222	241	211	233	256	224

TABLE 6.05

1990 PEDESTRIAN CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Total Crashes	Pedestrians Killed	Pedestrians Injured
100,000 and Over	17	723	740	17	748
50,000 - 99,999	2	79	81	2	80
25,000 - 49,999	6	180	186	6	183
10,000 - 24,999	13	177	190	13	188
5,000 - 9,999	6	75	81	6	82
2,500 - 4,999	2	39	41	2	40
1,000 - 2,499	3	30	33	3	31
Under 1,000	15	59	74	15	61
Unknown/Not stated	1	85	86	1	86
Total	65	1,447	1,512	65	1,499

TABLE 6.06

VEHICLE MOVEMENT IN 1990 PEDESTRIAN CRASHES

Vehicle Movement	Fatal Crashes	Injury Crashes	Total Crashes	Pedestrians Killed	Pedestrians Injured
Vehicle Going Straight	43	957	1,000	43	988
Vehicle Turning Left	9	127	136	9	135
Vehicle Turning Right	1	95	96	1	99
Vehicle Backing	1	87	88	1	91
Moving Vehicle Colliding with Parked Vehicle	0	8	8	0	8
Two Vehicles Colliding at Intersection	0	11	11	0	11
Moving Vehicle Colliding with Vehicle Stopped in Traffic	1	3	4	1	4
All Others	10	102	112	10	106
Not Stated	0	57	57	0	57
Total	65	1,447	1,512	65	1,499

TABLE 6.07

PRIOR ACTION OF PEDESTRIANS KILLED OR INJURED IN 1990

Action	Pedestrians Killed		Pedestrians Injured	
	Number	Percent	Number	Percent
Crossing Road (No Crosswalk and No Signal)	22	33.8%	411	27.4%
Crossing Against Signal	4	6.2	101	6.7
Crossing With Signal	2	3.1	292	19.5
Crossing In Crosswalk (No Signal)	5	7.7	104	6.9
Walking In Road With Traffic	8	12.3	54	3.6
Walking In Road Against Traffic	2	3.1	84	5.6
Standing In Road	1	1.5	64	4.3
Emerging From Front/Behind Parked Car	0	0.0	76	5.1
Child Getting On/Off School Bus	0	0.0	5	0.3
Pushing/Working On Vehicle	0	0.0	7	0.5
Working In Road	0	0.0	12	0.8
Getting On/Off Vehicle	1	1.5	14	0.9
Playing In Road	1	1.5	28	1.9
Not In Road	2	3.1	34	2.3
Other Pedestrian Action	17	26.2	213	14.2
Total	65	100.0%	1,499	100.0%

* Percent totals may not sum to 100% due to rounding.

TABLE 6.08

CONTRIBUTING FACTORS IN 1990 PEDESTRIAN CRASHES

Contributing Factors	Attributed to Pedestrians		Attributed to Motor Vehicle Drivers	
	Number	Percent	Number	Percent
Human factors				
Pedestrian Violation	672	87.4%	0	0.0%
Physical Impairment	82	10.7	53	4.3
Driver Inattention/Distraction	0	0.0	393	32.2
Failure to Yield Right of Way	0	0.0	276	22.6
Illegal or Unsafe Speed	0	0.0	78	6.4
Vision Obscured	1	0.1	123	10.1
Improper Lane Use	0	0.0	34	2.8
Disregard for Traffic Control Device	0	0.0	43	3.5
Driver Inexperience	0	0.0	37	3.0
Unsafe Backing	0	0.0	32	2.6
Improper Parking	0	0.0	13	1.1
Driving Left of Center	0	0.0	12	1.0
Improper Passing	0	0.0	6	0.5
Improper Turn	0	0.0	18	1.5
Other Human Factors	0	0.0	48	3.9
Vehicular Factors				
Defective Equipment	0	0.0	9	0.7
Skidding	0	0.0	9	0.7
Other Vehicular Factors	0	0.0	6	0.5
Miscellaneous Factors				
Weather Conditions	14	1.8	29	2.4
Road Defects	0	0.0	1	0.1
Total Contributing Factors Cited	769	100.0%	1,220	100.0%
No Improper Actions:	329		645	
Total Number of Pedestrians/Drivers	1,571		1,601	

Zero, one, or two contributing factors may be attributed to a single driver or pedestrian. This may cause the sum of the factors cited to differ from the number of drivers or pedestrians. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding.

TABLE 6.09

PEDESTRIAN FATALITIES' LEVEL OF ALCOHOL CONCENTRATION, 1981 - 1990

Year	Killed	Tested	Drinking* (.01 or more)	Drunk* (.10 or more)
1981	100	53	26 (49%)	23 (43%)
1982	76	40	18 (45%)	17 (43%)
1983	62	38	21 (55%)	18 (47%)
1984	55	38	20 (53%)	18 (47%)
1985	65	37	15 (41%)	10 (27%)
1986	71	49	28 (57%)	27 (55%)
1987	62	42	19 (45%)	17 (40%)
1988	69	47	22 (47%)	20 (43%)
1989	67	42	16 (38%)	12 (29%)
1990	65	41	16 (39%)	15 (37%)

* The percentage figures shown are based on the number of fatally injured pedestrians who were tested for alcohol concentration. (The law requires testing of all persons 16 years of age or older who die within four hours as a result of a motor vehicle crash.)

FIGURE 6.04

Percent of Fatally Injured Pedestrians Who Had Been Drinking, 1981 - 1990

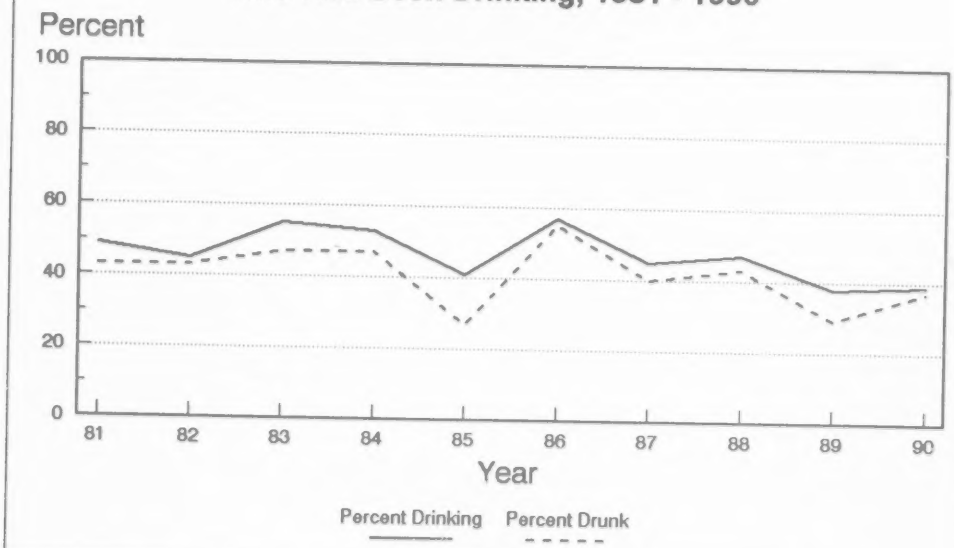


TABLE 6.10

1990 PEDESTRIAN FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY AGE

Age Group	Killed	Tested	Drinking (.01 or more)	Drunk (.10 or more)
14 & Younger	8	3	0	0
15 - 19	5	4	1	1
20 - 24	5	3	3	3
25 - 29	5	4	2	2
30 - 34	8	6	4	4
35 - 39	5	2	2	2
40 - 44	2	1	1	0
45 - 49	0	0	0	0
50 - 54	2	2	2	2
55 - 59	2	1	0	0
60 - 64	3	3	1	1
65 - 69	6	4	0	0
70 - 74	3	1	0	0
75 - 79	6	3	0	0
80 - 84	3	2	0	0
85 & Older	2	2	0	0
Total	65	41	16	15

TABLE 6.11

1990 PEDESTRIAN FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY TIME OF DAY

Time of Day	Killed	Tested	Drinking (.01 or more)	Drunk (.10 or more)
Midnight - 2:59 AM	8	8	6	6
3:00 - 5:59 AM	2	1	1	1
6:00 - 8:59 AM	8	6	1	1
9:00 - 11:59 AM	11	5	0	0
Noon - 2:59 PM	7	5	0	0
3:00 - 5:59 PM	6	2	1	1
6:00 - 8:59 PM	10	5	0	0
9:00 - 11:59 PM	13	9	7	6
Total	65	41	16	15

VII: BICYCLE CRASHES

Bicycles are subject to the same traffic laws as motor vehicles, but bicycle crashes are only reported to the Minnesota Department of Public Safety if they involve collision with a motor vehicle.

Data collected before 1984 counted bicycles only if they were the first "object" struck by the motor vehicle. Beginning in 1984, all motor vehicle crashes that involved collision with a bicycle were reported as bicycle crashes. The number of bicycle crashes reported here rose slightly as a result.

Bicycle crashes down
For the third year in a row, the number of crashes involving bicycles has fallen; this is also true of the number of bicyclists injured or killed. There were 1,357 bicycle crashes and 1,327 bicyclists injured in these crashes.

Bicyclist fatalities lowest in 25 years
There were 8 bicyclists killed in crashes in 1990. This is the lowest number in the last 25 years. The record low was in 1964 when 4 bicyclists were killed.

Most crashes in summer months
The three summer months of June, July, and August combined accounted for 55% of the crashes and 55% of the injuries. The month of July had the single highest number of crashes and injuries. The months of January and December had the least crashes. April had the highest number of fatal crashes, with 3.

Afternoon hours had most crashes
The hours from 3 - 6 PM accounted for just over one-third of the crashes. This was the most hazardous time period for every day of the week except Saturday. Tuesday had the most crashes (259) while Saturday and Sunday combined accounted for only 18% of the crashes. The single hour with the most crashes was from 4 - 5 PM.

The young and males most often injured
Males made up 70% of the injuries and 7 of the 8 fatalities. Males outnumbered females at least 2 to 1 at every injury severity level. The age group from 10-14 years old had the highest number of injuries. Bicyclists under 30 years old made up 80% of those injured.

Driver inattention top factor in crashes
The two contributing factors cited most often for both bicyclists and other drivers were: driver inattention/distraction and failure to yield the right of way. Officers cited "no improper driving" for 44% of motor vehicle drivers but only 25% of the bicyclists.

Bicyclists ride with traffic
Since most bicyclists ride with traffic, it is not surprising that 37% of bicyclists in crashes were riding with traffic prior to the crash. Another 29% were crossing the road just prior to the crash. Three of the 8 bicyclists killed were making a left turn just prior to the crash.

Rural areas overrepresented in fatal crashes
Areas of under 1,000 population had only 5% of the crashes and injuries, but 75% of the fatalities. Areas of over 100,000 population, on the other hand, had 37% of the crashes and injuries but none of the fatalities.

TABLE 7.01

BICYCLE CRASH SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Bicycle Crashes	1,255	1,130	1,220	1,282	1,375	1,367	1,574	1,448	1,392	1,357
Bicyclists Killed	10	12	14	15	10	12	15	16	10	8
Bicyclists Injured	1,213	1,105	1,194	1,258	1,342	1,309	1,452	1,401	1,353	1,327

TABLE 7.02

1990 BICYCLE CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Bicyclists Killed	Bicyclists Injured
January	0	7	2	9	0	7
February	0	16	0	16	0	17
March	0	36	1	37	0	38
April	3	77	3	83	3	78
May	0	148	5	153	0	154
June	0	193	10	203	0	194
July	2	262	9	273	2	266
August	1	257	7	265	1	264
September	2	154	2	158	2	153
October	0	105	3	108	0	107
November	0	47	1	48	0	46
December	0	4	0	4	0	3
Total	8	1,306	43	1,357	8	1,327

TABLE 7.03

1990 BICYCLE CRASHES BY TIME AND DAY

Time of Day	Total	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight - 2:59 AM	23	3	1	3	2	5	1	8
3:00 - 5:59 AM	11	1	2	0	2	2	3	1
6:00 - 8:59 AM	65	2	9	16	12	12	13	1
9:00 - 11:59 AM	128	9	15	32	14	14	21	23
Noon - 2:59 PM	254	29	34	45	29	39	47	31
3:00 - 5:59 PM	460	41	60	94	84	67	85	29
6:00 - 8:59 PM	289	18	62	45	47	47	46	24
9:00 - 11:59 PM	95	7	12	18	13	13	18	14
Unknown	32	1	5	6	8	6	5	1
Total	1,357	111	200	259	211	205	239	132

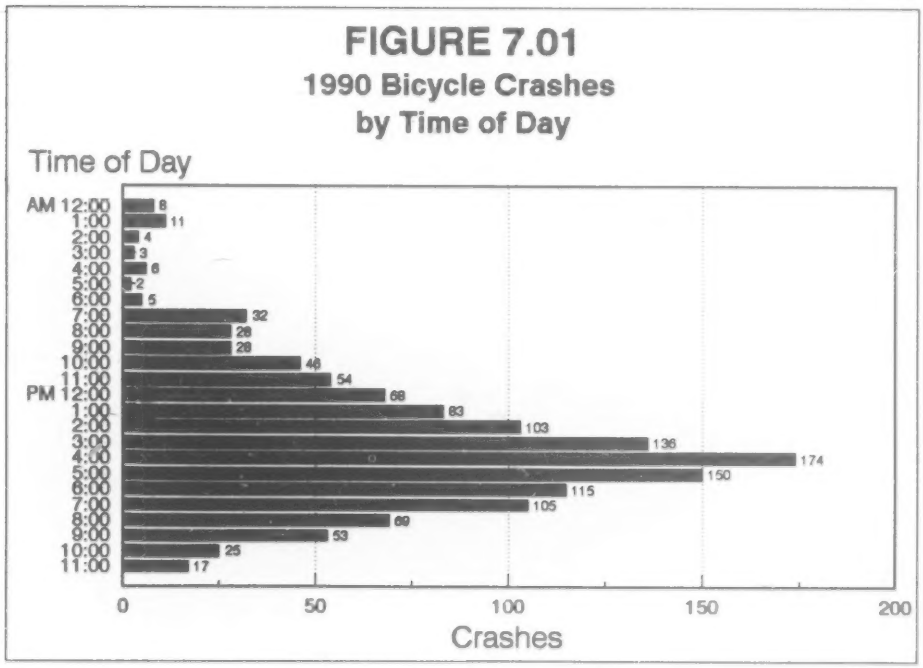


TABLE 7.04

BICYCLISTS KILLED OR INJURED BY AGE AND SEX, 1990

	Killed			Injured											
				Severe			Moderate			Minor			Total		
Age Group	M	F	Total	M	F	Total	M	F	Total	M	F	Total*	M	F	Total*
0 - 4	0	0	0	3	0	3	6	2	8	3	3	6	12	5	17
5 - 9	2	0	2	23	12	35	94	29	123	57	21	78	174	62	236
10 - 14	1	0	1	33	22	55	119	59	178	105	33	139	257	114	372
15 - 19	1	0	1	19	3	22	74	31	105	55	27	82	148	61	209
20 - 24	0	0	0	9	8	17	40	17	57	35	24	59	84	49	133
25 - 29	1	0	1	13	8	21	33	15	48	16	8	24	62	31	93
30 - 34	0	0	0	15	3	18	20	7	27	20	8	28	55	18	73
35 - 39	0	0	0	3	1	4	15	7	22	10	6	16	28	14	42
40 - 44	0	1	1	4	1	5	11	2	13	8	2	10	23	5	28
45 - 49	0	0	0	4	0	4	4	0	4	4	2	6	12	2	14
50 - 54	0	0	0	1	1	2	7	0	7	3	1	4	11	2	13
55 - 59	0	0	0	1	0	1	3	1	4	2	1	3	6	2	8
60 - 64	1	0	1	2	2	4	0	0	0	0	2	2	2	4	6
65 - 69	0	0	0	0	0	0	3	0	3	0	0	0	3	0	3
70 - 74	1	0	1	0	0	0	1	0	1	2	0	2	3	0	3
75 & Older	0	0	0	0	0	0	1	1	2	0	0	0	1	1	2
Not Stated	0	0	0	1	1	2	7	4	11	38	10	62	46	15	75
Total	7	1	8	131	62	193	438	175	613	358	148	521	927	385	1,327

* Where columns do not add across to total, sex was not stated on the accident report.

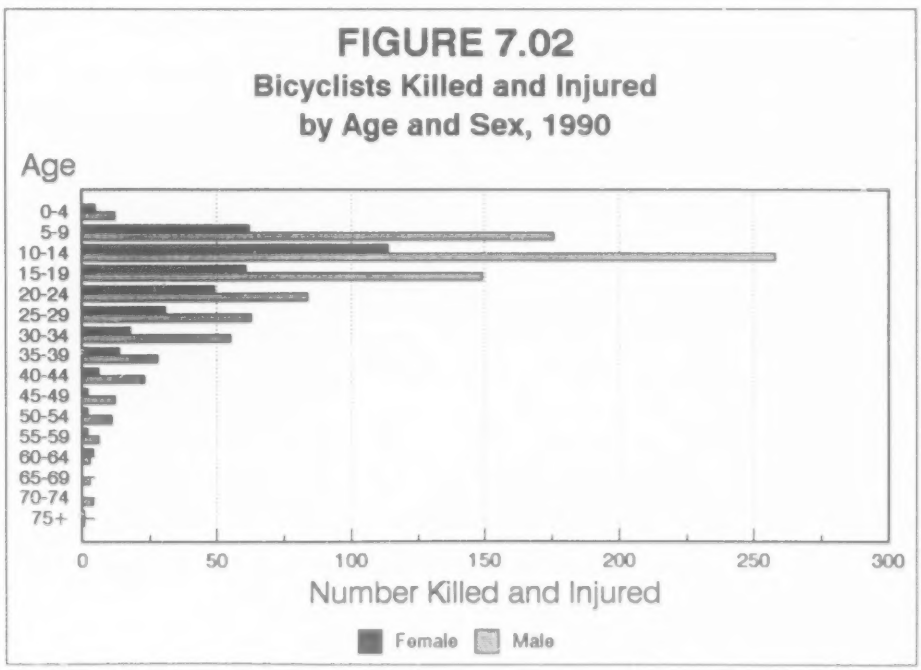


TABLE 7.05

CONTRIBUTING FACTORS IN 1990 BICYCLE CRASHES

Contributing Factors	Attributed to Bicyclists		Attributed to Motor Vehicle Drivers	
	Number	Percent	Number	Percent
Human Factors				
Driver Inattention/Distraction	297	27.2%	312	34.1%
Failure to Yield Right of Way	170	15.6	282	30.9
Improper/Unsafe Lane Use	115	10.5	33	3.6
Disregard for Traffic Control Device	113	10.4	27	3.0
Driver Inexperience	95	8.7	14	1.5
Vision Obscured	41	3.8	93	10.2
Improper Turn	40	3.7	19	2.1
Driving Left of Roadway Center--Not Passing	33	3.0	7	0.8
Illegal/Unsafe Speed	26	2.4	23	2.5
Physical Impairment	20	1.8	14	1.5
Improper Passing/Overtaking	8	0.7	18	2.0
Impeding Traffic	6	0.5	3	0.3
Following Too Closely	6	0.5	8	0.9
Improper Parking/ Starting/Stopping	4	0.4	14	1.5
Improper or No Signal	2	0.2	5	0.5
Unsafe Backing	1	0.1	13	1.4
Other Human Factors	48	4.4	17	1.9
Vehicular Factors				
Defective Equipment	34	3.1	1	0.1
Skidding	5	0.5	3	0.3
Other Vehicular Factors	16	1.5	4	0.4
Miscellaneous Factors				
Weather, Road Defects	11	1.0	4	0.4
Total	1,091	100.0%	914	100.0%
No Improper Driving	345		603	
Total Number of Bicyclists/Drivers	1,377		1,377	

Zero, one, or two contributing factors may be attributed to a single driver or bicyclist. This may cause the sum of the factors cited to differ from the number of drivers or bicyclists. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding.

TABLE 7.06

PRIOR ACTION OF BICYCLISTS INVOLVED IN 1990 CRASHES

Prior Action	Bicyclists In Fatal Crashes	Bicyclists In Injury Crashes	Bicyclists In Property Damage Crashes	Bicyclists In All Crashes*
Riding With Traffic	1	494	14	509
Riding Against Traffic	1	124	2	127
Making Left Turn	3	69	0	72
Making Right Turn	0	29	1	30
Making U Turn	0	7	0	7
Riding Across Road	1	381	12	394
Slowing, Starting, Stopping	0	20	0	20
Other/Unknown	2	202	14	218
Total	8	1,326	43	1,377

* The total number of bicycle driver actions exceeds the number of bicycle crashes because some crashes involved more than one bicycle.

TABLE 7.07

1990 BICYCLE CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Bicyclists Killed	Bicyclists Injured
100,000 and Over	0	488	18	506	0	491
50,000 - 99,999	0	63	2	65	0	65
25,000 - 49,999	0	232	9	241	0	237
10,000 - 24,999	1	207	7	215	1	210
5,000 - 9,999	0	98	2	100	0	101
2,500 - 4,999	1	36	0	37	1	38
1,000 - 2,499	0	19	1	20	0	19
Under 1,000	6	61	2	69	6	61
Unknown	0	102	2	104	0	105
Total	8	1,306	43	1,357	8	1,327

VIII: SCHOOL BUS CRASHES

School bus travel remains relatively safe in Minnesota. For the past ten years, the number of fatalities in school bus crashes has ranged from 2 to 8 per year. While 77% of the school bus crashes involved no injuries, this is true of only 69% of all types of motor vehicle crashes statewide in 1990. Because buses may carry many passengers however, a small number of crashes may involve a large number of injuries.

Number of crashes returns to normal
The total number of crashes involving school buses dropped to 674 in 1990. This appears to be a return to normal after an unusually high number in 1989. Of the 674 crashes, 5 were fatal, 149 involved a non-fatal injury, and 520 were property-damage-only crashes.

School bus occupants killed
There were 6 fatalities in 1990. For the first time since 1985, a school bus occupant was killed. Two school bus drivers and one school bus passenger were killed. Also killed were the driver of another vehicle that collided with a school bus, an elderly pedestrian, and a student running to catch a bus.

Injuries both on bus and in other vehicles
Of the 335 people killed and injured in school bus crashes, 57% were on the bus and 41% were in other vehicles that collided with the bus. Only 2% of the injuries and fatalities were sustained by pedestrians. The injuries were split almost evenly between the sexes; 53% were male and 47% female. On the bus, 5-9 year-olds had the most injuries; in other vehicles, 15-19 year-olds had the most injuries.

Most injuries minor
Of the injuries sustained in school bus crashes, 58% were minor and only 10% were severe. These injuries were distributed throughout the various population sizes of cities. Of the 6 fatalities, 3 occurred in cities/townships of under 1,000 population.

Most crashes involve more than one vehicle
A full 84% of the crashes and 88% of the injuries involved collisions with another motor vehicle. In contrast, only 1% of the crashes involved collision with a pedestrian.

Crashes occur during daytime hours
Not surprisingly, most crashes revolved around the school day. Thirty-two percent of the crashes occurred in the before school hours of 6 - 9 AM, another 31% happened during the school hours of 9 AM - 3 PM, and another 30% after school from 3 - 6 PM.

February has most crashes
The month of February had the highest number of crashes, accounting for 14% of the total. The three summer months of June, July and August combined, when most schools are not in session, accounted for only 5% of the crashes. The month of September had the highest number of injuries.

Driver inattention contributes to crashes
The contributing factor cited most often for both school bus drivers and other drivers in these crashes is driver inattention/distraction. However, 42% of school bus drivers were found to have committed no improper action; this was true of 30% of the other drivers involved. Drivers of non-school bus vehicles were slightly more likely to have contributed to the crash by illegal or unsafe speed than were school bus drivers.

Crash sites don't have traffic control device
Only 3% of crashes involved a school bus stop arm and 42% occurred where there was no traffic control device. No fatalities occurred under either of these conditions. Another 26% of the crashes occurred at stop signs.

TABLE 8.01

SCHOOL BUS CRASH SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total Crashes	681	729	687	675	723	662	530	679	828	674
Fatal Crashes	2	2	7	3	4	3	6	3	4	5
Persons Killed	2	2	8	3	4	3	6	3	4	6
Injury Crashes	155	160	161	176	191	160	141	175	167	149
Persons Injured	*	282	321	340	366	265	244	359	281	329
Property Damage Crashes	524	567	519	496	528	499	383	501	657	520
School Buses in Crashes	692	737	694	686	729	667	534	684	834	680

* Not Available.

TABLE 8.02

AGE AND SEX OF PERSONS KILLED AND INJURED* IN 1990 SCHOOL BUS CRASHES

Age Group	Total**	In Bus	Pedestrian	In Other Vehicle	Male	Female
0 - 4	7	1	1	5	3	4
5 - 9	64	60	2	2	34	30
10 - 14	62	56	1	5	31	31
15 - 19	68	32	1	35	31	37
20 - 24	25	5	0	20	15	10
25 - 29	16	2	0	14	7	9
30 - 34	12	5	0	7	5	7
35 - 39	11	2	0	9	8	3
40 - 44	6	0	0	6	3	3
45 - 54	13	7	0	6	8	5
55 - 64	13	3	0	10	10	3
65 & Older	9	1	2	6	4	5
Unknown	29	17	1	11	18	9
Total	335	191	8	136	177	156

* Injuries and fatalities have been added together for this table.
** There were 2 cases where the sex of the person was not stated.

TABLE 8.03

PERSONS KILLED OR INJURED IN 1990 SCHOOL BUS CRASHES BY POPULATION OF AREA

Population of City or Township	Killed	Injured			
		Severe	Moderate	Minor	Total
100,000 and Over	2	5	8	73	86
50,000 - 99,999	0	1	1	2	4
25,000 - 49,999	0	5	9	20	34
10,000 - 24,999	1	1	4	9	14
5,000 - 9,999	0	4	43	46	93
2,500 - 4,999	0	0	0	4	4
1,000 - 2,499	0	1	2	1	4
Under 1,000	3	16	29	33	78
Unknown	0	1	7	4	12
Total	6	34	103	192	329

TABLE 8.04

1990 SCHOOL BUS CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Collision With:						
Other Motor Vehicle	2	131	432	565	2	290
Parked Motor Vehicle	0	4	62	66	0	4
Bicycle	0	3	0	3	0	3
Pedestrian	2	6	0	8	2	6
Animal	0	0	2	2	0	0
Train	1	0	0	1	2	21
Fixed Object	0	3	20	23	0	3
Non-collision:						
Overturn	0	1	2	3	0	1
Other	0	1	2	3	0	1
Total	5	149	520	674	6	329

TABLE 8.05

1990 SCHOOL BUS CRASHES BY TIME OF DAY

Time of Day	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Midnight - 2:59 AM	0	0	3	3	0	0
3:00 - 5:59 AM	0	0	0	0	0	0
6:00 - 8:59 AM	3	48	163	214	4	165
9:00 - 11:59 AM	1	20	63	84	1	26
Noon - 2:59 PM	0	32	96	128	0	48
3:00 - 5:59 PM	1	42	156	199	1	82
6:00 - 8:59 PM	0	2	15	17	0	2
9:00 - 11:59 PM	0	3	8	11	0	3
Unknown	0	2	16	18	0	3
Total	5	149	520	674	6	329

TABLE 8.06

1990 SCHOOL BUS CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	0	8	51	59	0	11
February	1	18	77	96	1	26
March	0	12	51	63	0	28
April	1	19	34	54	1	34
May	1	9	42	52	1	23
June	0	1	15	16	0	1
July	0	4	9	13	0	4
August	0	2	6	8	0	2
September	0	27	48	75	0	96
October	0	16	56	72	0	24
November	1	15	64	80	2	46
December	1	18	67	86	1	34
Total	5	149	520	674	6	329

TABLE 8.07

CONTRIBUTING FACTORS IN 1990 SCHOOL BUS CRASHES

Contributing Factors	Attributed to School Bus Drivers Number	Attributed to School Bus Drivers Percent	Attributed to Drivers of Other Vehicles Number	Attributed to Drivers of Other Vehicles Percent
Human Factors				
Driver Inattention/Distraction	103	31.0%	144	29.9%
Failure to Yield Right of Way	65	19.6	64	13.3
Following Too Closely	25	7.5	36	7.5
Illegal or Unsafe Speed	24	7.2	61	12.7
Unsafe Backing	20	6.0	8	1.7
Improper Turn	19	5.7	7	1.5
Vision Obscured	17	5.1	21	4.4
Improper or Unsafe Lane Use	12	3.6	13	2.7
Disregard for Traffic Control Device	7	2.1	23	4.8
Improper Parking/Starting/ Stopping	6	1.8	8	1.7
Driver Inexperience	4	1.2	26	5.4
Driving Left of Roadway Center--Not Passing	3	0.9	6	1.2
Improper or No Signal	1	0.3	0	0.0
Improper Passing/Overtaking	1	0.3	8	1.7
Physical Impairment	0	0.0	4	0.8
Pedestrian Violation	0	0.0	3	0.6
Impeding Traffic	0	0.0	2	0.4
Other Human Factors	1	0.3	3	0.6
Vehicular Factors				
Skidding	9	2.7	14	2.9
Defective Equipment	3	0.9	8	1.7
Other Vehicular Factors	1	0.3	2	0.4
Miscellaneous Factors				
Weather Conditions	11	3.3	20	4.2
Total	332	100.0%	481	100.0%
No Improper Driving	283		206	
Total Number of Drivers	680		682	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. Bicyclists and pedestrians are included as other drivers in this table.

TABLE 8.08

1990 SCHOOL BUS CRASHES BY TRAFFIC CONTROL DEVICE

Traffic Control Device	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
None	0	55	225	280	0	140
Traffic Signal	1	29	105	135	1	43
Stop Sign--All Approaches	1	5	23	29	1	8
Other Stop Sign	1	40	105	146	2	92
Yield Sign	1	7	11	19	1	25
School Bus Stop Arm	0	5	15	20	0	9
Railroad Crossing Device	0	2	4	6	0	2
No Passing Zone	1	1	2	4	1	3
Other	0	2	10	12	0	4
Unknown	0	3	20	23	0	3
Total	5	149	520	674	6	329

IX: MOTOR VEHICLE/TRAIN CRASHES

Crashes reported in this section involve a motor vehicle and a train. Train collisions with pedestrians or bicyclists are not counted as traffic crashes for the purpose of this publication. Motor vehicle/train crashes are few in number but are more likely to be fatal; less than 1% of all crashes statewide were fatal but 11% of motor vehicle/train crashes were fatal in 1990.

Crashes reach record low
There were 116 motor vehicle/train crashes in 1990. This is a 15% decrease from the average of the previous five years. This year's total ties with the 1986 for the all time low.

Fatalities up, injuries down
There were 17 fatalities in 1990. Of these, 12 were drivers and 5 were passengers. This is the highest number of fatalities since 1979 and a 52% increase from the prior five year average. On the other hand, injuries continue their downward trend. There were 67 injuries in 1990. This is a 10% decrease from the prior five year average.

One crash had many victims
One particular crash (involving a school bus) accounted for almost one-third of the persons injured and two fatalities. If not for this one crash, there may have been a record low number of injuries in 1990.

Teens most injured age group
The 10-19 age group accounted for 42% of the injuries and almost one-fourth of the fatalities. However, a single crash produced all of the injuries in the 10-14 age group; it was also responsible for 11 of the 18 injuries in the 15-19 age group. The age group from 30-34 was the next most often injured age group.

March had highest number of crashes
The month of March had the highest number of crashes with 14. The average was 10 per month. October had the highest number of fatal crashes with 4. November had the highest number of fatalities and injuries, but most of the injuries were in a single crash.

9 AM - Noon most crash-involved
The three hour time period from 9:00 AM to Noon accounted for 22% of the crashes. Of the days of the week, Friday had the most crashes with 27, and Sunday the least with 9.

Still the same three factors
For the past nine years the three factors cited most often as contributing to motor vehicle/train crashes have been: driver inattention/distraction, failure to yield right of way, and disregard for traffic control device. Non-human factors accounted for only 6% of the contributing factors cited.

Crashes at marked crossings
At least 90% of all crashes, injuries, and fatalities occurred where there was a railroad crossing sign or a stop sign. This is especially important because 19% of the contributing factors cited were for disregard for traffic control device.

TABLE 9.01

MOTOR VEHICLE/TRAIN CRASH SUMMARY, 1981 - 1990

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total Crashes	192	164	174	149	134	116	119	168	142	116
Fatal Crashes	13	5	11	7	8	5	4	9	11	13
Persons Killed	15	7	15	11	13	12	4	12	15	17
Injury Crashes	N/A	73	69	56	63	53	55	56	48	35
Persons Injured	102	92	85	73	87	66	74	70	75	67
Property Damage Crashes	124	86	94	86	63	58	60	103	83	68

TABLE 9.02

AGE OF PERSONS KILLED OR INJURED IN 1990 MOTOR VEHICLE/TRAIN CRASHES

		Injured			
Age Group	Killed	Severe	Moderate	Minor	Total
0-4	0	1	0	0	1
5-9	1	0	1	1	2
10-14	0	0	10	0	10
15-19	4	6	10	2	18
20-24	1	1	3	3	7
25-29	0	0	4	2	6
30-34	4	2	3	3	8
35-39	1	0	0	2	2
40-44	1	3	2	1	6
45-49	1	0	0	1	1
50-59	0	0	0	2	2
60-69	2	0	0	1	1
70 & Older	2	0	2	0	2
Not Stated	0	0	0	1	1
Total	17	13	35	19	67

TABLE 9.03

1990 MOTOR VEHICLE/TRAIN CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	3	1	6	10	3	1
February	1	5	5	11	1	7
March	0	3	11	14	0	4
April	1	4	5	10	1	5
May	0	1	5	6	0	1
June	0	4	3	7	0	7
July	0	1	4	5	0	1
August	0	2	10	12	0	2
September	0	0	8	8	0	0
October	4	2	6	12	5	4
November	3	4	4	11	6	26
December	1	8	1	10	1	9
Total	13	35	68	116	17	67

TABLE 9.04

1990 MOTOR VEHICLE/TRAIN CRASHES BY TIME AND DAY

Time of Day	Total	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight - 2:59 AM	13	3	0	1	0	3	1	5
3:00 - 5:59 AM	5	2	0	0	0	0	0	3
6:00 - 8:59 AM	13	1	2	1	3	2	4	0
9:00 - 11:59 AM	25	1	3	1	4	3	8	5
Noon - 2:59 PM	19	0	2	1	3	6	6	1
3:00 - 5:59 PM	13	1	1	4	4	1	1	1
6:00 - 8:59 PM	19	0	5	4	2	1	5	2
9:00 - 11:59 PM	9	1	0	1	1	2	2	2
Total	116	9	13	13	17	18	27	19

TABLE 9.05

CONTRIBUTING FACTORS IN 1990 MOTOR VEHICLE/TRAIN CRASHES

Contributing Factor	Number	Percent
Human Factors:		
Driver Inattention/Distraction	37	26.8%
Failure to Yield Right of Way	33	23.9
Disregard for Traffic Control Device	26	18.8
Illegal or Unsafe Speed	14	10.1
Vision Obscured	6	4.3
Physical Impairment	9	6.5
Improper Parking	2	1.4
Improper Turn	1	0.7
Driver Inexperience	1	0.7
Other Human Factor	1	0.7
Vehicular Factors		
Skidding	1	0.7
Miscellaneous Factors		
Weather Conditions	7	5.1
Total	138	100.0%
No Improper Driving	19	
Number of Drivers	120	

Zero, one or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. No contributing factors are cited for train operators.

TABLE 9.06

1990 MOTOR VEHICLE/TRAIN CRASHES BY TRAFFIC CONTROL DEVICE PRESENT

Traffic Control Device	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Standard Crossing Sign	8	18	20	46	10	26
RR Flashing Lights	1	8	16	25	1	9
RR Crossing Stop Sign	1	2	10	13	1	2
RR Crossing Gate	1	2	5	8	2	4
Stop Sign	2	2	9	13	3	23
Other	0	0	1	1	0	0
None	0	3	7	10	0	3
Total	13	35	68	116	17	67

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